

Our UK Natural Health Service

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The UK led the Industrial Revolution that had a major impact in disconnecting people from nature. Two major acts of parliament in the 19th and 20th century were required to halt the contamination of water and air. However despite rising life expectancy and improvement in healthcare the rise in chronic disease is already causing more deaths than all other causes combined. This is likely to have a major negative impact on life expectancy in the future. Health inequalities appear to be major driver for ill health possibly by increasing chronic stress particularly amongst the poor. Contact with nature has been shown to offset this chronic stress. This paper explains how the UK Government have changed their policies in the past 10 years to embrace nature as a public health issue. Three UK schemes are then used to illustrate how people can be encouraged to reconnect with nature in communities healthcare and amongst employers.

Introduction

If you managed to watch the opening ceremony of the London Olympics you will have watched the history of Great Britain unfold. The pleasant green land with a large rural population dramatically changed with the rise of massive chimneys, smoke and furnaces. This moved on to the invention of the Internet by the British computer scientist Tim Berners-Lee and the technological revolution.

We then look at the excitement and health of all the athletes attending in an ultra-modern stadium bathed in LED lights, clean air and an audience of healthy people some in their 80s. Even 50 years ago many people of this age would not have been alive or simply confined to their homes due to

ill health. So what is so wrong in this seemingly perfect world?

On the surface things look good with life expectancy rising and many health measures improving. The world is not as perfect as we think because we have become disconnected from the world around us. There is increasing evidence that a hostile and barren environment creates increased stress, obesity and greater risk of mortality. Stress causes damage in the cell particularly in the mitochondria¹ (leading to cell damage and disease). Stress also encourages poor health behaviour such as excess alcohol, smoking and eating². However, the one health behaviour that is now been thought to be one of the most important risk factor for over

20 long term conditions is inactivity^{3,4}, and when we are chronically stressed we appear to retreat and become less active. The initial downturn in population health can be masked by increasing our spending on healthcare with more expensive interventions. However, many of the dramatic improvements in health in the 20th century such as antibiotics, cardiac medication such as ‘Statins’ and cancer treatment are unlikely to develop further in the 21st century and traditional healthcare is no longer fit for purpose to prevent the global rise of non-communicable diseases which already claim more lives than all other causes of death put together⁵.

Healthcare services have been estimated to contribute only a third of the improvements we could make in life expectancy⁶ – changing people’s lifestyles and removing health inequalities contribute the remaining two thirds. Many of the biggest future threats to health, such as diabetes and obesity, are therefore dependant on public health.⁷

History of environment and health in the UK

Twice in the last two centuries the UK Parliament has acted as a result of catastrophic poor health due to an unhealthy environment:

Water environment

The Public Health Act of 1875 ensured that there was clean drinking water for city dwellers and that raw sewage no longer entered the water system. In fact it wasn’t the numerous outbreaks

of Cholera that spurred our law makers into action, it was when the river Thames clogged up with sewage in 1858, often referred to the “Great Stink”, which affected the politicians whilst debating in parliament⁸.

Air environment

The Clean Air Act of 1956 was created in response to the great smog of 1952 that caused the death of 12,000 people in the subsequent weeks. London had frequent smog events because there was no restriction on what could be burnt in a household which contributed to 60% of the air pollution in winter⁹. The result in certain weather conditions was “Smog”; a mix of fog and smoke with pollutants of sulphur dioxide that we now know would have caused deaths long after the event itself¹⁰.

There has been no Act of Parliament to connect the quality of land directly with health. However over the last 150 years there have been many attempts to connect health with natural landscape.

19th Century witnessed many parks being developed in towns and cities across the United Kingdom to improve health, reduce disease, crime and social unrest as well as providing ‘Green Lungs’ for the city. The parks were designed by the Victorians to provide clean air and relaxation with natural vistas.

In Hackney east London less than one km from the Olympic Stadium the Registrar for births deaths and mar-

riages noted, in his report of 1839, a high death rate in this area due to overcrowding, air pollution and poor sanitation¹¹.

He wrote: *"....a Park in the East End of London would probably diminish the annual deaths by several thousands.... and add several years to the lives of the entire population"*.

This was followed in 1840 by a petition to Queen Victoria, signed by 30,000 local residents, urging the formation "within the Tower Hamlets, of a Royal Park". There were no open spaces in the East End of London, and there were fears that disease would spread from the stinking industries and slum population of 400,000.

This was the first public park to be built in London specifically for the people. The Act of Parliament, passed in 1841, made it the first to be planned in the country, and indeed the first in the world, specifically intended to meet the health needs of the surrounding communities¹²

UK standards for access to greenspace

In 1929 Raymond Unwin¹³ noticed a lack of open space in London and recommended that there should be seven acres (2.83ha) per 1000 people and that for every four acres (1.6 ha) there should be one (0.4ha) for quiet relaxation. In the 1990s this was modified by the Government and in 2008 new standards was published by the Natural England^a called the Accessible Natural Greenspace Standards (ANGST).

ANGST¹⁴ recommends that everyone, wherever they live, should have an accessible natural greenspace:

- of at least 2 hectares in size, no more than 300 metres (5 minutes' walk) from home;
- at least one accessible 20 hectare site within two kilometres of home;
- one accessible 100 hectare site within five kilometres of home; and
- one accessible 500 hectare site within ten kilometres of home; plus
- a minimum of one hectare of statutory Local Nature Reserves per thousand population.

Using nature to address health inequalities

In the UK in 1980 the Black Report¹⁵ on inequalities in health was published and stated clearly that social deprivation was a major determinant of poor health status. This was particularly evident in the UK where health status between the rich and the poor had widened. Since this report health inequalities have become a major public health issue that is urgently being redressed.

People living in the poorest areas will, on average, die seven years earlier than people living in richer areas and spend up to 17 more years living with poor health. They have higher rates of mental illness; of harm from alcohol, drugs and smoking; and of childhood emotional and behavioural problems¹⁶

It is estimated that inequality in illness accounts for productivity losses of

^a Natural England is the Government's official conservation body and part of the Department of Environment.

£31-33 billion per year, lost taxes and higher welfare payments in the range of £20-32 billion per year, and additional National Health Service (NHS) healthcare costs associated with inequality are well in excess of £5.5 billion per year¹⁷.

Mitchell & Popham¹⁸ found that income-related inequality in health is affected by exposure to greenspace (Figure 1). Health inequalities related to income deprivation in all-cause mortality and mortality from circulatory diseases were lower in populations living in the greenest areas.

The UK Government asked the professor in epidemiology and public health, Michael Marmot¹⁹, to look at the effect that health inequality had on health of the UK. This report is now the foundation for health policy for the next 10 years. Among other things he explains how important greenspace and nature are to reduce inequalities and states that *“improving good quality of open and green spaces available across the so-*

cial gradient” is a main priority.

In 2010 the London Mayor launched a report on health inequalities²⁰. The report recommends authorities to *“Raise the awareness of the health benefits of access to nature and greenspace and extend these benefits to all Londoners.”*

How Government will use green space, parks and nature to address health problems

Since 2000 there has been an increasing interest with the relationship between greenspace and health in particular its benefit to physical activity, mental health and health inequalities.

The Government commissioned a major review of the economic benefits of the Ecosystem called the *UK National Ecosystem Assessment*²¹. This is the first analysis of the UK's natural environment in terms of the benefits it provides to society and our continuing prosperity. It looks at the economic value

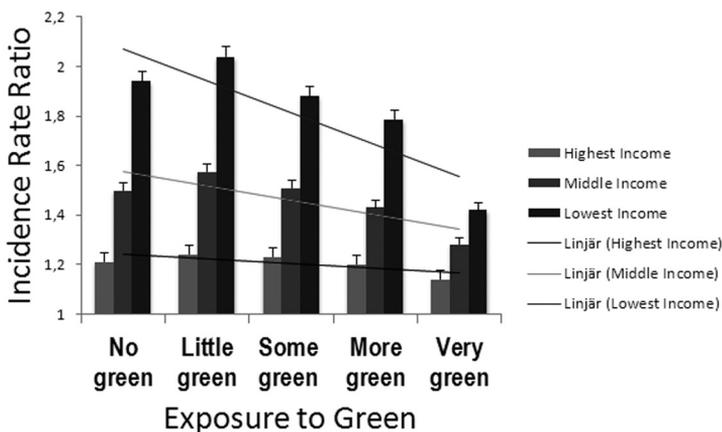


Figure 1. This graph compares those with different incomes and the effect that nearby green space has on their mortality. Adapted from Mitchell, R. and Popham, F. (2008)

of all habitats in the UK and is based on the WHO Millennium Ecosystem Assessment. Chapter 23 covers the Health Values from Ecosystems. The Key findings from this chapter are

- Observing nature and participating in physical activity in Greenspace play an important role in positively influencing human health and well-being.^b
- Ecosystems provide three generic health benefits:^c
 - o Direct health benefits (stress reduction)
 - o Indirect positive effects (increased social engagement and physical activity)
 - o A reduction in threats of pollution and disease vectors. (climate regulation)
- There is limited evidence to show that habitats with more bio-diversity have a greater effect on health.
- There is a growing use of ‘green care’ in many contexts in the UK, including therapeutic horticulture, animal assisted therapy, ecotherapy, green exercise therapies and wilderness therapy.^c
- Green exercise in all habitats results in significant improvements in both self-esteem and mood.^b
- Contact with nature during youth can directly impact upon healthy adult behaviours.^c

Department of Health

The Report by the Department of Health in 2009, Be Active Be Healthy²² was very specific about promoting greenspace and the natural environment.

“The Government is committed to improve the quality of parks and greenspace so that everyone has access to good-quality greenspace close to where they live.”

“Contact with nature has been shown to improve people’s physical and mental health. Specifically it increases physical activity, reduces stress and strengthens communities”

The Department of Health has since delivered a five year strategy of public health called Healthy Lives Healthy People²³

“Improving the environment in which people live can make healthy lifestyles easier. When the immediate environment is unattractive, it is difficult to make physical activity and contact with nature part of everyday life. Unsafe or hostile urban areas that lack greenspace and are dominated by traffic can discourage activity. Lower socioeconomic groups and those living in the more deprived areas experience the greatest environmental burdens.”

This has led to every local authority each year to measure: *“Utilisation of greenspace for exercise/health reasons”*²⁴. Parks and greenspace will be regularly monitored to measure the number of people using it for physical activity.

Department of Food and Rural Affairs (DEFRA)

In June 2011 DEFRA published the white paper, “The Natural Choice: Securing the Value of Nature” as its strategy to extract the greatest benefit from nature in the UK.

Amongst its recommendations are:

^b Well Established

^c Established but incomplete

• *Local Nature Partnerships and the Health and Wellbeing Boards should actively seek to engage each other in their work. Forthcoming guidance will make clear that the wider determinants of health, including the natural environment, will be a crucial consideration in developing joint strategic needs assessments and joint health and wellbeing strategies.*

• *To ensure local health professionals and others have the information they need, we have committed Public Health England to provide clear, practical evidence about how to improve health by tackling its key determinants including access to a good natural environment.*

The implementation of strategy for healthy behaviour

The route to a healthier behaviour is difficult. Below are three schemes that attempt not only to guide choice through “*changing the default*” but new technology is being used to “*guide choice through incentives*”.

1. Health Walks

Health Walks were started by the author from his practice in 1996. There are now 650 schemes providing 180,000 walks a year in England with similar schemes in Scotland and Wales (www.walkingforhealth.org.uk).

Health Walks are short walks for anyone that last between 30 and 60 minutes with two leaders, one at the front and one at the back. The leaders are volunteers who have been trained about safety, health and how to motivate new members. The main aim is to get those who are inactive to increase their levels of activity using social and environmental drivers. Each series of walks must

include introductory walks of less than 1 mile to ensure that everyone however unfit can start on a health walk.

Training is all voluntary and takes place using a cascade model. Thirty cascade trainers cover all of England. They deliver about eight sessions a year each training 20 volunteers. Five thousand new Health Walk leaders are therefore trained up every year. Insurance covers all risks to the walk leaders so that they do not have any liability. Despite the 1.8 million contacts a year and some obvious injuries for over 10 years no claim has ever been made.

Data is entered onto a central database and updated for each walk. This provides valuable data to show the demographics of attendees.

With the funding from Macmillan charity (www.macmillan.org.uk) and delivery by the Ramblers (www.ramblers.org.uk) the aim is for every GP surgery to have at least two local health walks to encourage people to walk in local natural environment. Health Walks provide an opportunity to get 140,000 people who have had no previous experience with the outdoors to be connected to the natural environment every week.

2. Green Gym (GG)

The Green Gym (www.tcv.org.uk/greengym) was also set up by author from his practice in Sonning Common in 1997. Its principle is to create both a healthy natural environment and healthy people. The scheme was adopted by The Conservation Volunteers and supported by the Department of Health.

Each session lasts about three hours and can take place in many locations including parks and allotments. Over 100 schemes have been set up around the UK and patients are either referred through their GP or self-referred.

In March 2008, Green Gym celebrated 10 Years of activity. In its 10 years since the Sonning Common pilot was created near Reading, the Green Gym had:

- Involved approximately 10,000 volunteers in improving over 2,500 greenspace
- Established 95 GGs across the UK
 - 20 now run entirely by the volunteers themselves.
- Spread to schools to provide a new way to tackle inactivity in children.

Studies have shown that the Green Gym participants improve their health and fitness through regular involvement in practical conservation work. Two independent evaluations indicated

the following benefits:

- There was increased benefit to their mental health and boosted self-esteem through learning new skills.²⁵
- Using a battery of physiological tests to measure changes in participants' fitness over a sixth month period, improvements in strength and flexibility levels were noted, as were expressions of feeling fitter, having more stamina and greater everyday activity.
- Physical activity was at an intensity of 80% of maximum heart rate that is enough to increase fitness, but compared to aerobic sessions the duration of this activity is three hours compared to 30 minutes in an aerobics session. See Figure 2.

3. The Physical Activity Loyalty Card (PAL) scheme (www.palcard.co.uk)

In Northern Ireland civil servants working in Stormont Park were staying in

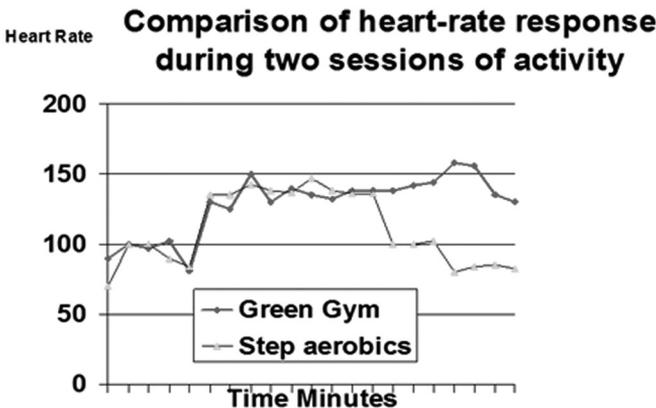


Figure 2. Comparison of a female aged 40 yrs taking part in a 1 hour aerobics session and the Green Gym. Only 20 minutes of the aerobics session was the pulse rate in the cardiovascular training zone as opposed to 40 minutes in the Green Gym. The Green Gym then continued for a further 2 hours most of the time the subject remained in the cardiovascular training zone.

the building and not taking any exercise despite being surrounded by landscaped parkland. Queen's University worked with Intelligent Health to create a technological solution that used incentives. They were given a Radio Frequency Identification (RFID) card and encouraged to walk in the park at lunchtime by swiping the card on receivers based around the park. Each walk was recorded on their own website. A randomised controlled trial²⁶ was set up in which both groups had the cards (the PAL cards) and website and leader boards but only one group had rewards such as discount vouchers to local shops. The results of this trial are due to be published but showed a significant increase in walking that were sustained 6 months after the trial was completed.

The author is working with NHS London to introduce similar technology to encourage patients to use parks and green space in London.

Conclusion

Nature, Greenspace and Parks had a strong role in improving health in the 19th century. While medicine became very successful in treating disease in the 20th century the role of nature to improve health was diminished. Now in the 21st century the epidemic of non-communicable disease is showing the weakness of our current healthcare system. Engaging people with a healthy accessible natural environment is being promoted at the highest level of the UK Government. How we engage those most at need will be the next great challenge.

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