



The Mersey Forest Developing a Natural Health Service

Presentation to The Duncan Society and Merseyside Environmental Trust

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December 2015





Executive Summary

The Mersey Forest was officially approved in 1994. As one of twelve Community Forests across England, its aim was to use trees and woodland as a focus for environmental regeneration, tackling the range of socio-economic issues on Merseyside and North Cheshire.

From the outset increasing opportunities for recreation was an objective. Over time this has developed greater focus on health and wellbeing and three strands of activity can be clearly identified in the work of the Forests Partnership.

- Increasing access and accessibility - in order to get people “more people, more active, more often”.
- Promoting the passive benefits of trees and woodlands for health - that fact that trees filter and cool air and provide other benefits, even if we are unaware of their impacts on health and wellbeing.
- Developing targeted products that use the natural environment to address specific health issues – we identify this as “The Natural Health Service”

Communities across The Mersey Forest areas have a wide range of health needs. Health inequalities are marked, both at a local level and compared to national data. The natural environment can play a role in improving health; it is one of the wider determinants of health.

Our approach in many ways is not new. The 1848 Public Health Act contained references to open spaces urban parks have their roots in public health implementation. Today we are rediscovering what the pioneers of public health knew about the role that green spaces can play in keeping communities healthy.

There is a developing, though not yet complete, evidence base to support the approach The Mersey Forest is taking in addressing health of communities in the area. Work with Liverpool John Moores and the University of Liverpool is underway to create long-term research programme, a centre of excellence for research for the Natural Health Service. This is already producing groundbreaking research that is helping to improve delivery of The Natural Health Service.

Big Lottery has invested in the Nature4Health project. Nature4Health will target health inequalities, will provide an opportunity to develop the consortium approach for The Natural Health Service and continue to develop the evidence base.

In the medium term, the aim is to mainstream The Natural Health Service through participation in the commissioning process, with continued research and development refining the products with a significant input from participants to maximise the benefits delivered to individuals, communities and ultimately the NHS.



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Acknowledgements

Thanks to Mersey Forest Team colleagues for their support whilst writing this paper and delivering projects, programmes and research that have contributed to the development of a Natural Health Service in The Mersey Forest.

Thank you also to the Duncan Society and Merseyside Environmental Trust for the opportunity to present our work and for the stimulus to collate our work and share our ideas, strategy and research.

PN



"Leap of Faith"

Ilchester Park



Introduction

The Mersey Forest, established in 1991, is one of twelve Community Forests across England. The Community Forests were part of a policy to tackle post-industrial landscapes, which had low woodland cover, using forestry as a mechanism to revitalise landscapes and engage communities in a long-term programme of regeneration.

The Forests identified how, through environmental regeneration and community engagement, a wide range of socio-economic issues, including health, could be addressed.

The boundary of The Mersey Forest was agreed in 1991, with amendments to the boundary agreed in 2000 and again in 2010. These amendments were to align the boundary with local administrative areas.

The Mersey Forest is not a single area of trees; it is the growing network of trees and woodlands across Merseyside and North Cheshire. The Forest includes individual trees in gardens, streets or public spaces, as well as small and larger scale woodlands. The Forest is the sum of all these elements.

The Mersey Forest area is home to 1.7 million people (Figure 1).

The Mersey Forest, as well as being a “place” on the map, is a partnership made up of seven local authorities, Natural England, the Forestry Commission, the Environment Agency, along with landowners, businesses, and local communities, co-ordinated by the Mersey Forest Team. The work of The Mersey Forest Team and partners is guided by our long-term strategic plan¹.

Forest Plans are recognised in national policy such as the National Planning Policy Framework, Environment White Paper and Forest Policy Statement.

¹ www.merseyforest.org.uk/plan



Figure 1: The Mersey Forest area



The long-term vision for the Forest highlights the aspiration to get “more from trees”, to use the Mersey Forest to create attractive places to live and work and reflects the original goals for Community Forests to tackle socio-economic issues as well as deliver environmental improvements.

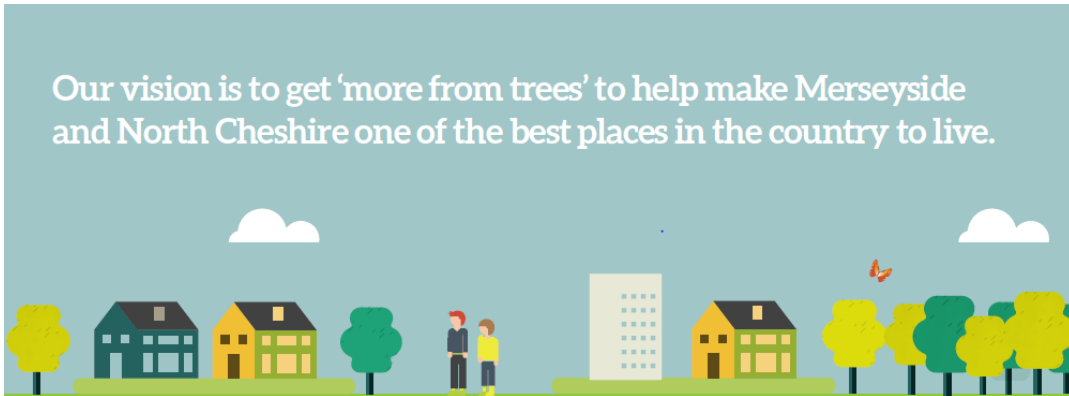


Figure 2: Mersey Forest Vision - Forest Plan 2014



Figure 3 - Forest School in Liverpool

The Forest Plan sets out ten priority areas of activity.



Figure 4: Ten priorities for The Mersey Forest

Improving health and wellbeing through the delivery of The Mersey Forest is an important objective. The Forest Plan includes specific policy and a chapter on health and wellbeing.

We will promote the health and wellbeing benefits of trees and woodlands, for individual health as well as the wider wellbeing of our communities. We will make use of the maturing woodland resource to support the five ways to wellbeing. We will work with health professionals to maximise the use of woodlands, from increased day to day use through to General Practitioner referrals.

Figure 5: Health Policy - Extract from Mersey Forest Plan



The Mersey Forest is well placed to help develop and implement the health agenda as it operates at a landscape-scale across local authority boundaries, is founded on a partnership approach, has links to many local and national organisations and has a track record of innovation and delivery.

Most importantly work is based on community engagement and involvement.

We will encourage all to participate in the planning, enhancement and enjoyment of The Mersey Forest and, through their commitment to it, to play a part in its long-term stewardship and ownership.

Figure 6: Community Engagement - Extract from Mersey Forest Plan

Since its inception the Forest Partnership has delivered:

- 9 million new trees planted over 3,000ha of new woodland, increasing woodland cover by over 75%
- Over 39,000 community events
- Over £40m of new funding brought into the area for environmental improvements through the Forest Team and partners
- 217 km of new access routes created
- 180 new jobs created

An independent survey has shown that over 90% of the local population supports the work of The Mersey Forest, 64% say that their local environment has improved as a result of work by the Partnership and 24% say that they use their local community woodland at least once a week.

Using the Green Infrastructure Valuation Toolkit², the total economic value gained by the delivery of The Mersey Forest to date is over £1.5bn

This includes an estimated £250m of health benefits, calculated as the value of lives saved due to increases in walking and cycling use of the new woodland areas and increased active travel along green routes³.

² GI Valuation Toolkit v1.3 available here;

<http://www.greeninfrastructurenw.co.uk/html/index.php?page=projects&GreenInfrastructureValuationToolkit=true>



The paper briefly covers how The Mersey Forest Team and wider partnership have developed their work to improve health and wellbeing across Merseyside and North Cheshire and the emergence and development of the “Natural Health Service” in The Mersey Forest, our work with the two Liverpool universities and the opportunities provided by Reaching Communities investment of £420,000 in the three year Nature4Health project.

The Need

An ageing, rising population, with increasing incidence of chronic mental and physical health conditions, increasing costs of care and pressure on health budgets, all conspire to put enormous pressure on our health services.

Across the Mersey Forest area, Joint Strategic Needs Assessments, carried out by Health and Wellbeing Boards, consistently show higher than average levels of obesity in adults and children, poor mental health and incidence of coronary heart disease and respiratory illnesses.

Local authority priorities for public health improvements are shown in Figure 6: Local Authority Public Health Priorities.

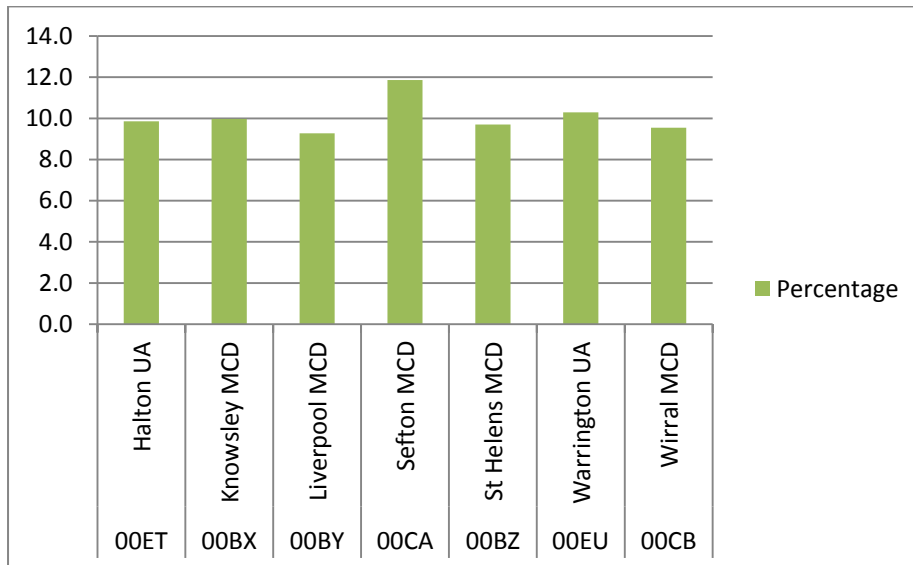
Local Authority	Mental Health	Obesity	Inequalities	Coronary Heart Disease
Halton	X	X		
Knowsley	X	X		X
Liverpool	X			
Sefton		X		X
St.Helens	X	X		
Wirral			X	

Figure 7: Local Authority Public Health Priorities

³ Models used to generate the economic data suggest the equivalent of 14 lives are saved each year due to increased access to community woodlands and more active travel.

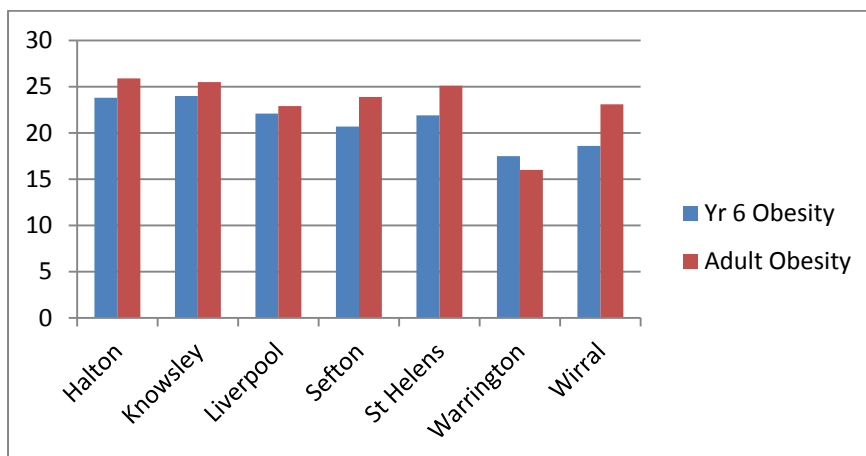
A relatively low percentage of adults are participating in the recommended levels of physical activity across the city region.

Figure 8: Percentage of adults participating in recommended levels of activity⁴



The levels for Year 6 childhood obesity and adult obesity are shown in Figure 9 .

Figure 9: Percentage of Year 6 and Adult Obesity by Local Authority



⁴ Data derived from figures from the NW Public Health Observatory - <http://www.nwph.net/nwpho/>

Health inequality is also an important issue for the city region. In Liverpool, the life expectancy of someone born in the more deprived areas in the north of the city can be 11 years less than someone born in a more affluent area. On the Wirral the difference can be up to 14 years.

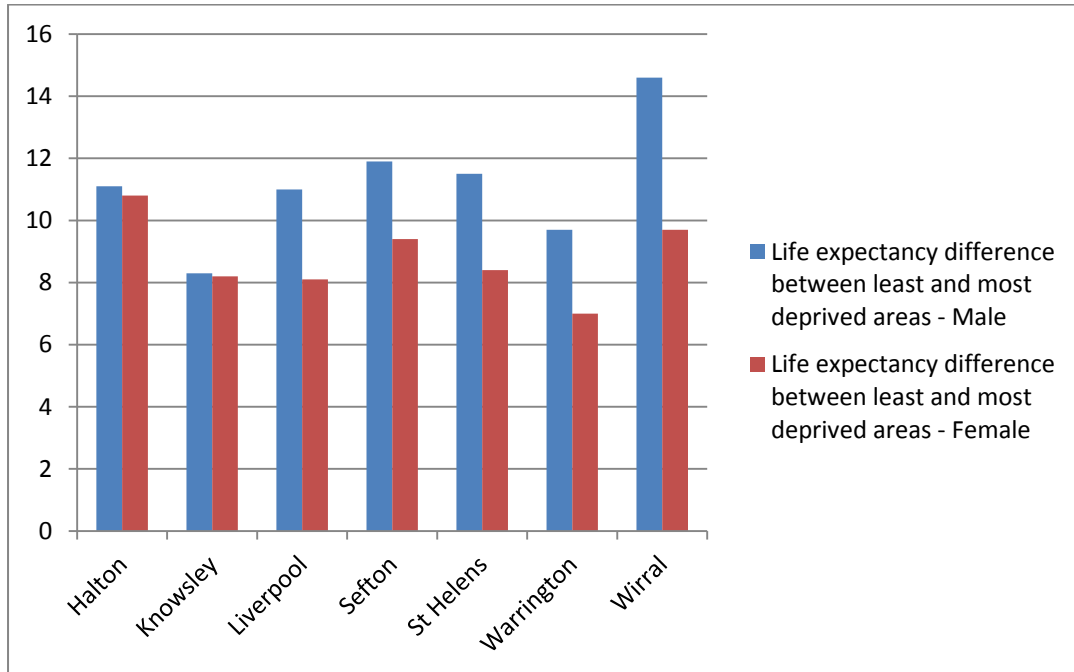


Figure 10 Life expectancy variations



The Evidence

There have been a number of publications in recent years that have brought together the evidence to support the delivery of activity, treatments and therapy that is based in the natural environment (for example Rapid Review of the evidence base in relation to physical activity and green space and health⁵, Improving Access to Local Greenspaces⁶,

Liverpool City Region and Warrington Green Infrastructure (GI) Framework⁷). Much of the following section has been taken from the GI Framework.

Research by Sport England⁸ estimates that the cost of poor health due to lack of exercise could be as high as £2bn per year to the national economy. The same report estimates that a 10% reduction in those aged 16+ who are sedentary would benefit the economy by £500 million a year in reduced NHS costs, and increased economic output due to lower ill health and absence from work.

Data from the ‘National Travel Survey’ shows that the distance people walk and cycle has declined significantly in the last three decades⁹. Although in The Mersey Forest recent work has shown how creating “green” active travel routes has increased levels of walking and cycling¹⁰.

Various epidemiological studies have demonstrated a positive relationship between green space and population health¹¹. For example, a study in the UK¹² found ‘a higher proportion of green space in an area was generally associated with better population health.’

A Natural England study¹³ showed that:

- People who live furthest from public parks were 27% more likely to be overweight or obese.
- Children able to play in natural green space gained 2.5 kg less weight per year than children who did not have such opportunities.

⁵ http://www.hegroup.org.uk/images/resources/Physical_Activity_Green_Space_Health_Report.pdf

⁶ <http://www.instituteofhealthequity.org/projects/improving-access-to-green-spaces>

⁷ <http://www.merseyforest.org.uk/our-work/liverpool-city-region-green-infrastructure-framework/>

⁸ Sport England (2002) A Strategy for Delivering Sport and physical Activity Cabinet Office (2002) Game Plan: A strategy for delivering government’s sport and physical activity objectives. Available at: http://www.gamesmonitor.org.uk/files/game_plan_report.pdf.

⁹ Department for Transport (2006) National travel survey Travel Survey 2006

¹⁰ LSTF Survey, 2015, The Mersey Forest

¹¹ Mitchell, R. and Popham, F. (2007) Greenspace, urbanity and health: relationships in England. Journal of Epidemiology and Community Health 61: 681-683.

¹² See Mitchell and Popham (2007)

¹³ Natural England (2009) Green Space Access, Green Space Use, physical activity and overweight: a research summary. Based on original research for Natural England by University of Bristol and University of East Anglia.



- 1,300 extra deaths occur each year in the UK amongst lower income groups in areas where the provision of green space is poor.

NICE guidance^{14, 15} contains extensive evidence to support their policy recommendations. This is an important evidence base as it is used as the basis for guidance to the health service. It suggests that increasing physical activity can help to prevent or manage over 20 conditions and diseases including coronary heart disease, diabetes and obesity. The guidance also emphasises the importance of having environments that encourage healthy lifestyles, creating opportunities to walk or cycle easily and in safety. Increasing physical activity levels in the population will help prevent or manage coronary heart disease¹⁶.

The Marmot Review on Health Inequalities identified green spaces as important in helping to address health inequalities. For example, from the review:

Priority E:

- *To create and develop healthy and sustainable places and communities*
- *Improve the availability of good quality open and green spaces across the social gradient*
- *Fully integrate the planning, transport, housing, environmental and health systems to address the social determinants of health*
- *Support community regeneration: community participation, reduce isolation¹⁷*

The Liverpool City Region, Green Infrastructure Framework, produced by The Mersey Forest Team, collated data from a broad range of sources to identify how, as part of the broader determinants of health, the natural environment can be utilised more effectively in policy and health programme delivery to help to tackle health issues in the city region.

For example the incidence of Coronary Heart Disease and Obesity were each mapped along with availability of open access sites, or with tree cover for the air quality.

¹⁴ NICE (2008) Public Health Guidance 8: Promoting and creating built or natural environments that encourage and support physical activity. National Institute for Health and Clinical Excellence, London.

¹⁵ NICE (2009) Public Health Guidance 17: Promoting physical activity, active play and sport for pre-school and school-age children and young people in family, pre-school, school and community settings. National Institute for Health and Clinical Excellence, London.

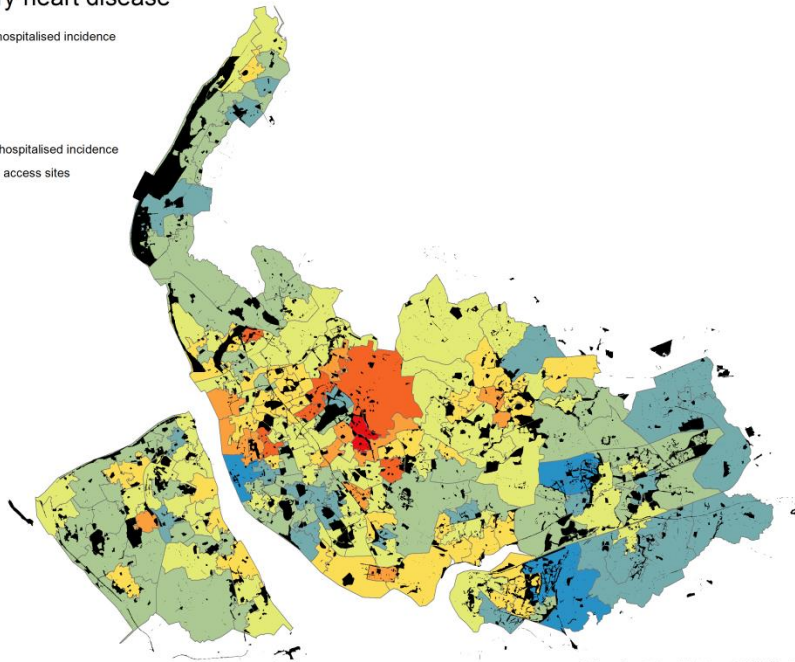
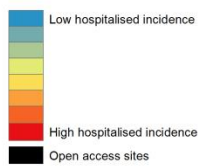
¹⁶ Department of Health (2005) Choosing activity: a physical activity action plan. Department of Health, London.

¹⁷ Marmot Review

This, along with a wide range of other assessments, enabled a series of actions for the city region to be agreed. These actions are mandated by Nature Connected, the Liverpool City Region Local Nature Partnership.

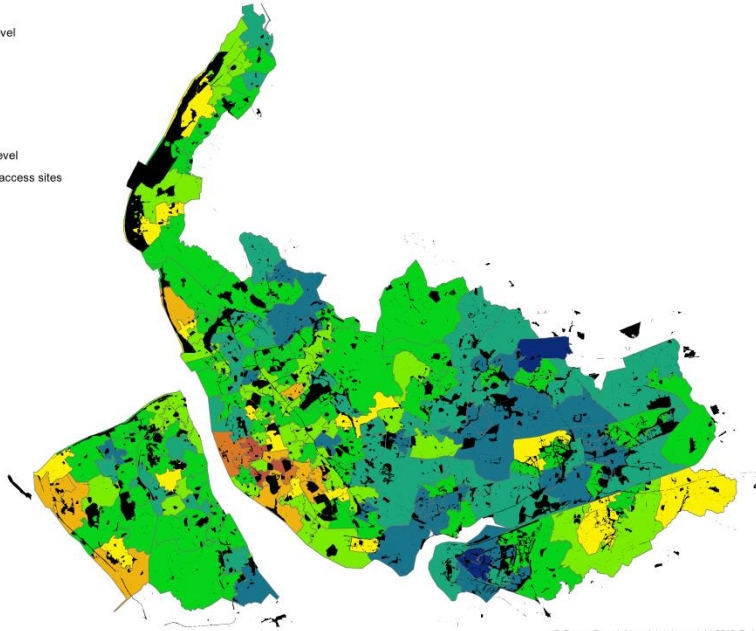
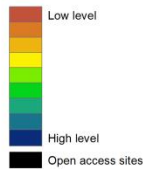
Map 1: Coronary heart disease

Coronary heart disease



Map 2: Obesity

Obesity



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Improving air quality and reducing noise pollution

Air pollution has been found to increase the risk of having a second heart attack among cardiac patients by 43%¹⁸. An increase in air pollution has also been identified to increase the short-term risk of stroke¹⁹.

Trees and woodlands are particularly effective at removing some elements of pollution from the atmosphere. Work by Lancaster University identified ozone, nitrogen dioxide and PM10 particles as being the main pollutants that can be removed. The study estimates that doubling the number of trees in the West Midlands would reduce excess deaths due to particulate pollution by up to 140 per year²⁰. A US study reported in the British Medical

¹⁸ American Friends of Tel Aviv University (2012, June 5). Air pollution linked to chronic heart disease. *Science Daily*. Available at: <http://www.sciencedaily.com/releases/2012/06/120605121700.htm>

¹⁹ Wellenius, G.A., Burger, M.D., Coull, B.A., Schwartz, J., Suh, H.H., Koutrakis, P., Schlaug, G., Gold, D.R., Mittleman, M.A. (2012). Ambient air pollution and the risk of acute ischemic stroke. *Archives of Internal Medicine* 172(3): 229-234.

²⁰ <http://www.es.lancs.ac.uk/people/cnh/docs/UrbanTrees.htm> CEH (no date) Trees and sustainable urban air quality. Available at: <http://www.es.lancs.ac.uk/people/cnh/UrbanTreesBrochure.pdf>



Journal concluded that childhood asthma was lower in areas with higher levels of tree cover²¹.

The Woodland Trust report on the positive impact of trees on urban air quality includes recommendations for the best types of tree to plant to help reduce air pollution²².

Noise can be an issue that can lead to additional stress and poor health. Trees and other vegetation can play an important role in attenuating noise through reflecting and absorbing sound energy. One estimate suggests that seven decibel noise reduction is achieved for every 33m width of forest²³ whilst other reported field tests show apparent loudness reduced by 50% by wide belts of trees and soft ground²⁴.

²¹ Schellenbaum Lovasi GS, G. Quinn, J.W., Neckerman, K.M., Perzanowski, M.S. and Rundle, A. (2008) Children Living in areas with more street trees have a lower prevalence of asthma, J Epidemiol Journal of Epidemiology and Community Health 62:647-649.

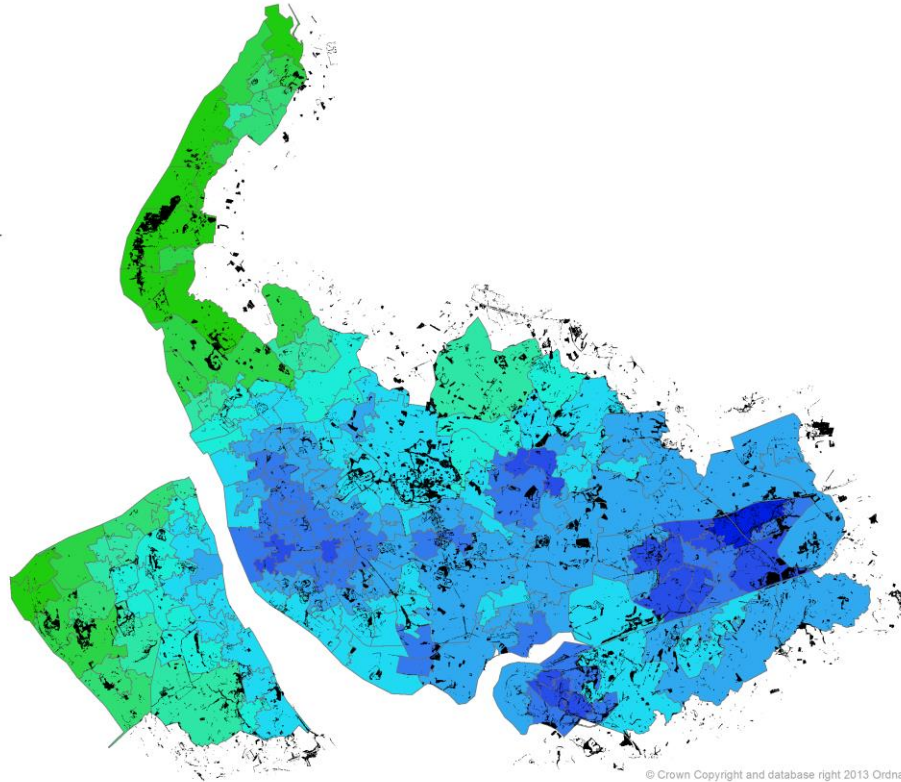
²²<http://www.woodlandtrust.org.uk/en/campaigning/ourcampaigns/Documents/urbanairqualityreport.pdf>

²³ Coder, R.D. (1996) Identified Benefits of Community Trees and Forests, University of Georgia Cooperative Extension Service - Forest Resources Publication FOR96-39

²⁴ Dwyer, J.F., McPherson, E.G., Schroeder, H.W. and Rowntree, R.A. (1992) Assessing the benefits and Costs of the urban forest. Journal of Arboriculture 18(5),): 227 - 234.

Map 3: Air quality

Air quality



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Improving Mental Health

Mental health problems are increasing: one in six adults have mental health problems at any one time, for half these people the problem will last for more than a year and it is estimated that around one in four people will suffer some form of mental illness at some point in their lives²⁵. Mental health problems are estimated to cost the economy £23 billion²⁶ a year in lost output.

²⁵ Department of Health (2009) The Future Vision Coalition.

Available at: <http://www.newvisionformentalhealth.org.uk/about.html>

²⁶ The Sainsbury Centre for Mental Health (2003) Policy Paper 3: The Economic and Social Costs of Mental Illness. Available at:

http://www.centreformentalhealth.org.uk/pdfs/costs_of_mental_illness_policy_paper_3.pdf



It has been suggested that mental illness causes as much of the misery in Britain today as poverty does. “It is our greatest hidden problem”²⁷.

Whilst there is good evidence to show that green infrastructure can help to support more active lifestyles, the evidence for positive impact on mental health problems is even stronger²⁸.

There is evidence that green spaces can have a positive effect on mental wellbeing and cognitive function through both physical access and usage²⁹, as well as through access to views of the natural environment³⁰. Work by Ulrich in the US has been influential in hospital design, with a number of hospitals around the world (including Alder Hey in Liverpool) ensuring that wards have views of the natural environment. The aim is to both improve rates of recovery and quality of life of patients as well as reducing time spent in hospital, releasing more beds and improving the “productivity” of the hospital.

There is evidence that even the visual presence of green spaces and natural views of elements such as trees and lakes is enough to have a positive effect on stress levels, can promote a reduction in blood pressure and may encourage faster healing in patients following post-surgical intervention³¹.

Wilson's ‘biophilia hypothesis’³² seeks to explain the calming and mood enhancing effect of certain green spaces in terms of our evolutionary history. He suggests that our general preference for green environments is “hard wired”, that it comes about because we are genetically predisposed to such environments.

Direct evidence of the restorative effects of green space and mental health has been found in several studies. Two studies looking at children aged 7-12 found that green space can have a beneficial impact on concentration and on the ability to focus attention.³³

²⁷ Layard 2007 - Layard, R., Clark, D., Knapp, M. and Mayraz, G. ((2007) CEP Discussion Paper No 829. Cost-Benefit Analysis of Psychological Therapy. Centre for Economic Performance, London School of Economics, London. Available at: http://eprints.lse.ac.uk/19673/1/Cost-Benefit_Analysis_of_Psychological_Therapy.pdf).

²⁸ O'Brien et al. O'Brien, L., Williams, K. and Stewart, A. (2010) Urban health and health inequalities and the role of urban forestry in Britain: a review. Report to the Forestry Commission. Available at: <http://www.forestresearch.gov.uk/fr/INFD-83EHVX>

²⁹ Whitelaw et al. (2008) Physical activity and mental health: the role of physical activity in promoting mental wellbeing and preventing mental health problems: An evidence briefing. NHS Scotland, Edinburgh.

³⁰ Ulrich, R.S. (1984) View through a window may influence recovery from surgery. *Science* 224: 420–421.

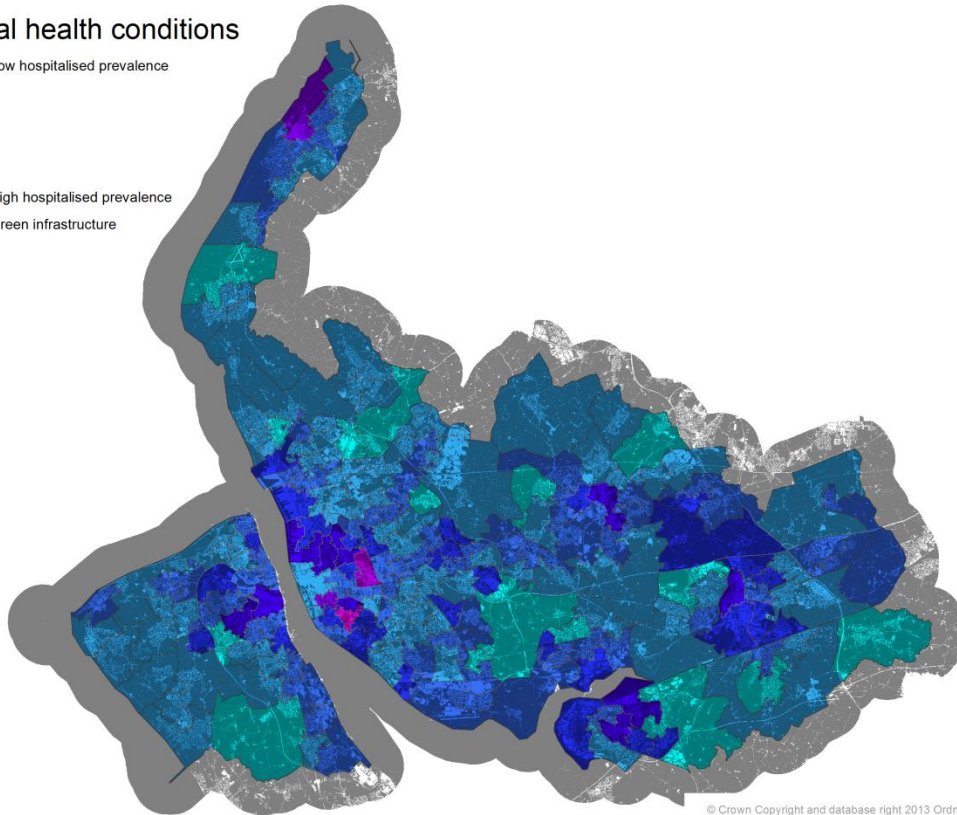
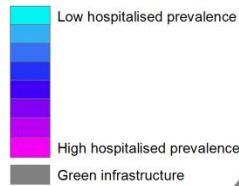
³¹ DEFRA Forest Research (2010) Benefits of Green Infrastructure. Report by Forest Research. Forest Research, Farnham.

³² Wilson (1984) *Biophilia: The human bond with other species*. Harvard University press, Cambridge, Massachusetts.

³³ Forest Research (2010) Benefits of Green Infrastructure. Report by Forest Research. Forest Research, Farnham.

There is evidence that there are synergistic effects of exercise in “green” environments that improves the positive impact on both physical and mental health.³⁴

Mental health conditions



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Map 4: Mental health and green infrastructure

Reducing Health Inequalities

Recent research at Glasgow University found that:

“Populations exposed to greener environments also enjoy lower levels of income deprivation related health inequality. Physical environments that promote good health may be important in the fight to reduce socio-economic health inequalities.”³⁵

³⁴ Pretty, J., Griffin, M., Sellens, M. And pretty, C. (2003) Green Exercise: Complementary Roles of Nature, Exercise and Diet in physical and Emotional Wellbeing and implications for Public Health Policy. CES occasional Paper 2003-1, University of Essex.



The Health is Wealth Commission was set up by partners across Liverpool City Region order to look at the wider determinants of health across the Liverpool City Region. This highlighted the need for greater integration between land use planning and transport to reduce the need for travel and promote sustainable modes of transport. The Commission emphasised the need to place health at the heart of planning, and promoted the idea of greening the physical environment to provide health and wellbeing benefits, and, in particular, emphasised the role that the historic parks can play in our health and wellbeing. Several recommendations from the Commission have green infrastructure implications. The commission called for:

- *A co-ordinated 'Health Improvement Plan' for the City-region be developed, through which resources can be specifically focused on delivering and evaluating a unified and targeted strategy against the health impacts of alcohol, smoking, poor diet and lack of physical activity across the City-region.*
- *'Design for Health and Wellbeing' initiative, led by the development of a Designing for Health and Wellbeing good practice guide.*
- *The establishment of a Parks Task Group, to investigate a new approach to the management, maintenance and marketing of urban parks.*

³⁵ Mitchell &, R. and Popham, F. (2008) Effect of exposure to natural environment on health inequalities: an observational population study. *The Lancet* 372(9650): 1655-1660.

Policy

In Public Health Policy³⁶, the role of the natural environment in helping to maintain or improve health is recognised as one of the “Wider Determinants of Health”.

‘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 and hostile urban areas that lack green spaces and are dominated by traffic can discourage activity. Lower socio-economic groups and those living in the more deprived areas experience greatest environmental burdens’.

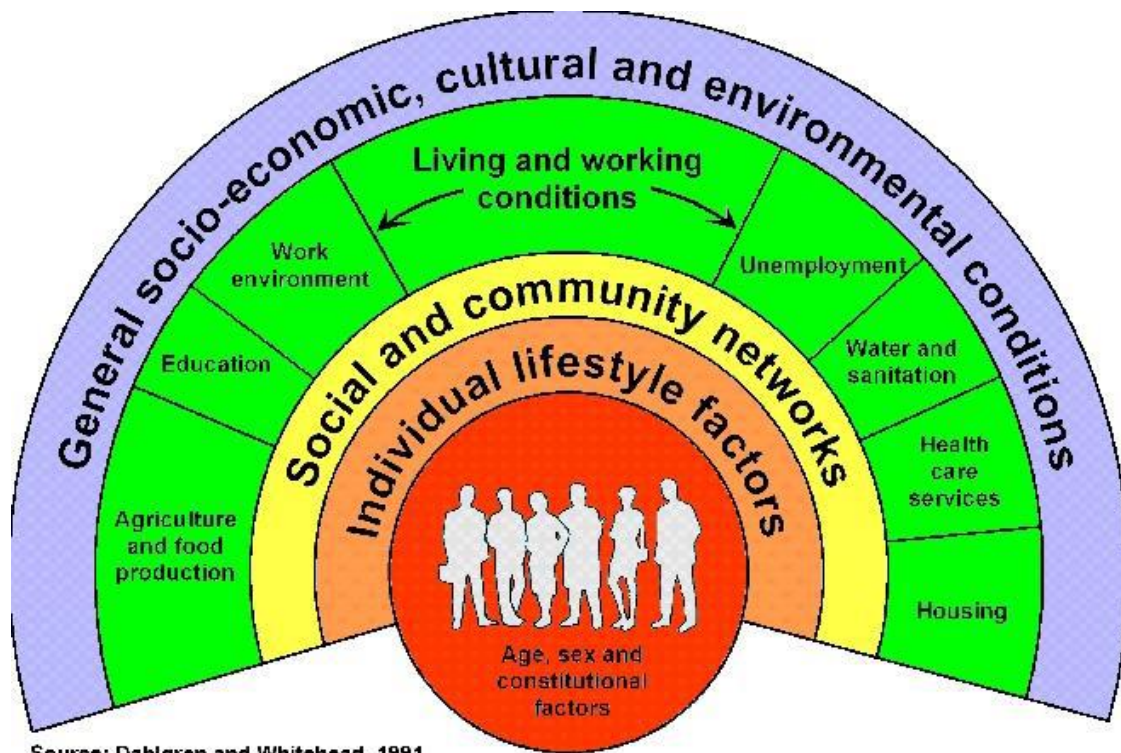


Figure 11: Wider determinants of health

³⁶ Public Health Outcomes Framework, 2013, Dept. of Health
https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/263659/2901502_PHOF_Improving_Outcomes_PT1B_v1_1.pdf page 5

The Public Health Outcome Framework³⁷ includes the assessment of public use of greenspace as an indicator for the Wider Determinants of Health. Whilst this is a very basic and possibly misleading indicator, it does at least show that the use of the natural environment is monitored in the wider determinants of health.

The NHS Heatwave Strategy identifies the function of green infrastructure in providing cooling and reducing the urban heat island effect. The strategy calls for a long-term plan for environmental action to provide this green infrastructure.

Level 0	Level 1	Level 2	Level 3	Level 4
Long-term planning All year See accompanying document 'Making the Case' for more detail	Heatwave and summer preparedness programme 1 June to 16 September	Heatwave is forecast – alert and readiness 60% risk of heatwave in the next 2 to 3 days	Heatwave action Temperature reached in one or more Met Office National Severe Weather Warning Service regions	Major incident – emergency response Central Government will declare a Level 4 alert in the event of severe or prolonged heatwave affecting sectors other than health
Working with partner agencies, incorporate into JSNA's/HWS's long term plans to prepare for, and mitigate, the impact of heatwaves, including: <ul style="list-style-type: none"> • how to identify and improve the resilience of those individuals and communities most at risk • ensuring that a local, joined-up programme is in place covering: <ul style="list-style-type: none"> • housing (inc loft and wall insulation and other plans to reduce internal energy use and heat production) • environmental action: (eg increase trees and green spaces; external shading; reflective paint; water features) • other infrastructure changes (eg porous pavements) • engaging the community and voluntary sector to support development of local community emergency plans • making progress on relevant Public Health Outcomes Framework indicators 	<ul style="list-style-type: none"> • work with partner agencies, providers and businesses to coordinate heatwave plans, ensuring vulnerable and marginalised groups are appropriately supported • work with partners and staff on risk reduction awareness (eg key public health messages – box 1), using a variety of methods to maximise dissemination • ensure care homes and hospitals are aware of the heatwave plan and are engaged in preparing for heatwaves • continue to engage the community and voluntary sector to support communities to help those most at risk • ensure other institutional establishments (eg prisons, schools) are aware of heatwave guidance • ensure organisers of large events take account of possible heat risks 	<ul style="list-style-type: none"> • communicate public media messages – especially to 'hard to reach' vulnerable groups • communicate alerts to staff and make sure that they are aware of heatwave plans • implement business continuity • increase advice to health and social care workers working in community, care homes and hospitals 	<ul style="list-style-type: none"> • media alerts about keeping cool • support organisations to reduce unnecessary travel • review safety of public events • mobilise community and voluntary support 	National emergency Continue actions as per Level 3 unless advised to the contrary Central government will declare a Level 4 alert in the event of severe or prolonged heatwave affecting sectors other than health and if requiring coordinated multi-agency
High-risk groups Community: over 75, female, living on own and isolated, severe physical or mental illness, urban areas, south-facing top flat, alcohol and/or drug dependency, homeless, babies and young children, multiple medications and over-exertion Care home or hospital: over 75, female, frail, severe physical or mental illness; multiple medications; babies and young children (hospitals).				
<small>*Because Level 2 is based on a prediction, there may be jumps between levels. Following Level 3, wait until temperatures cool to Level 1 before stopping Level 3 actions. ** Level 4: A decision to issue a Level 4 alert at national level will be taken in light of a cross-government assessment of the weather conditions, co-ordinated by the Civil Contingencies Secretariat</small>				

Figure 12: Extract from UK Heatwave Strategy³⁸

³⁷ Public Health Outcomes Framework, 2013, Dept. of Health

³⁸ Heatwave Plan for England – Protecting health and reducing harm from severe heat and heatwaves - NHS, 2015



Nothing New Under the Sun

Over the past 20 years, there has been an increasing focus on the role that the natural environment may play in helping to improve health and wellbeing and more recently reduce health inequalities.

However, despite all this “new” activity, the approach is not really very new, more a remembering of the origins of public health thinking and action.

The Public Health Act 1848, cited as a milestone in Public Health³⁹, provided for local authorities to provide “parks” for the first time. This was partly in response to the increasing resources squalor and the outbreaks of cholera in several cities. The movement of people into cities from rural areas was in part in part due to the amendment of the Poor Law in 1832.

The Public Health Act was perhaps as much about reducing the “costs” of poor health, borne by business, as improving the health of the poorest for their wellbeing⁴⁰.

“James Philips Kay, Neil Arnott and Southwood Smith, had reported that the expenditure needed to prevent disease would “ultimately amount” to less than the cost of the disease being created – the latter measured in lost productivity as well as the costs of hospital and burial care and the Poor Law support of widows and orphans. Sanitary measures were needed on grounds of economy as well as of humanity. In 1840, the Select Committee on the Health of Towns declared that preventive measures were required for reasons of humanity and justice to the poor, but equally for the safety of property and the security of the rich.”

For example, 170 years ago there were no public 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.

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

This type of statement could almost be “copied and pasted” into any health strategy for many cities and urban areas across the UK today.

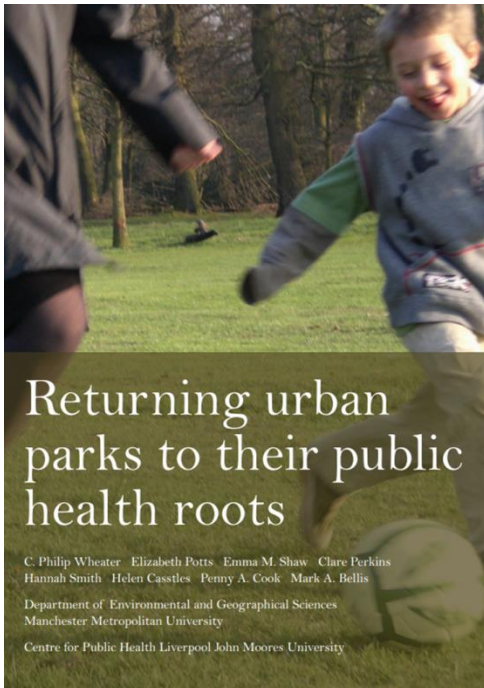
³⁹ FEE, Elizabeth and BROWN, Theodore M. *The Public Health Act of 1848*. Bull World Health Organ [online]. 2005, vol.83, n.11 [cited 2015-11-21], pp. 866-867. Available from: <http://www.scielosp.org/scielo.php?script=sci_arttext&pid=S0042-96862005001100017&lng=en&nrm=iso>. ISSN 0042-9686. <http://dx.doi.org/10.1590/S0042-96862005001100017>

⁴⁰ Authors views!

There is a clear link to the pioneering public health work of Dr Duncan.

“For the Victorians there was an apparent synergy between the reforms of Dr. Duncan and the impetus to create these great amenities for the promotion of public health and enjoyment.”⁴¹

It is not clear how or why the disconnect between health and natural environment occurred⁴², perhaps increasing clinical focus and the Public Health focus on sanitation, communicable diseases and specific public health issues reduced the focus on parks and open space, which became more “municipal”, horticultural and perhaps landscape-focussed.



In 2008, “Returning Parks to their Public Health Roots” was published by 2007. This report sought to highlight again those original links between health and open space provision in our cities and promote the fact that the connection between health and accessible open space has been well known for a long time. The increasing pressure on the National Health Service might mean that reflection on the original link between health and open space might be timely.

In 2008, Liverpool’s “Health is Wealth Commission” also called for action to improve access to green spaces noting that, in the ten years before 2008, spending on parks had reduced. Since the publication of the report, it is likely that the spending will have a least halved again⁴³. In some areas, it is predicted that there may be no budget available for non-statutory work post-2017, meaning no budget for parks or green space.

More recently the Liverpool Sustainability Commission highlighted the role that the natural environment can play in tackling poor health and it is anticipated that the forthcoming “green spaces” commission will also highlight the need to provide green spaces close to communities with high levels of poor health.

⁴¹ Health is Wealth Commission, (Susan Woodward and Clare Devaney (2010). The Liverpool City-region Health is Wealth Commission. European Review, 18, pp 35-46. doi:10.1017/S1062798709990111.)

⁴² Not clear to the author

⁴³ Rethinking Parks - Nature Connected, 2015



In 2011, Liverpool PCT and Liverpool City Council were joint commissioners of the Liverpool Green Infrastructure Strategy. This subsequently led to the development of the “Natural Choices” programme in the City, a forerunner to the Natural Health Service programme. Natural Choices provided support for local communities to use green infrastructure to improve health and wellbeing.

The programme, supported by The Mersey Forest Team for the PCT, successfully supported groups, in areas of need identified from the Liverpool City Green Infrastructure Strategy.

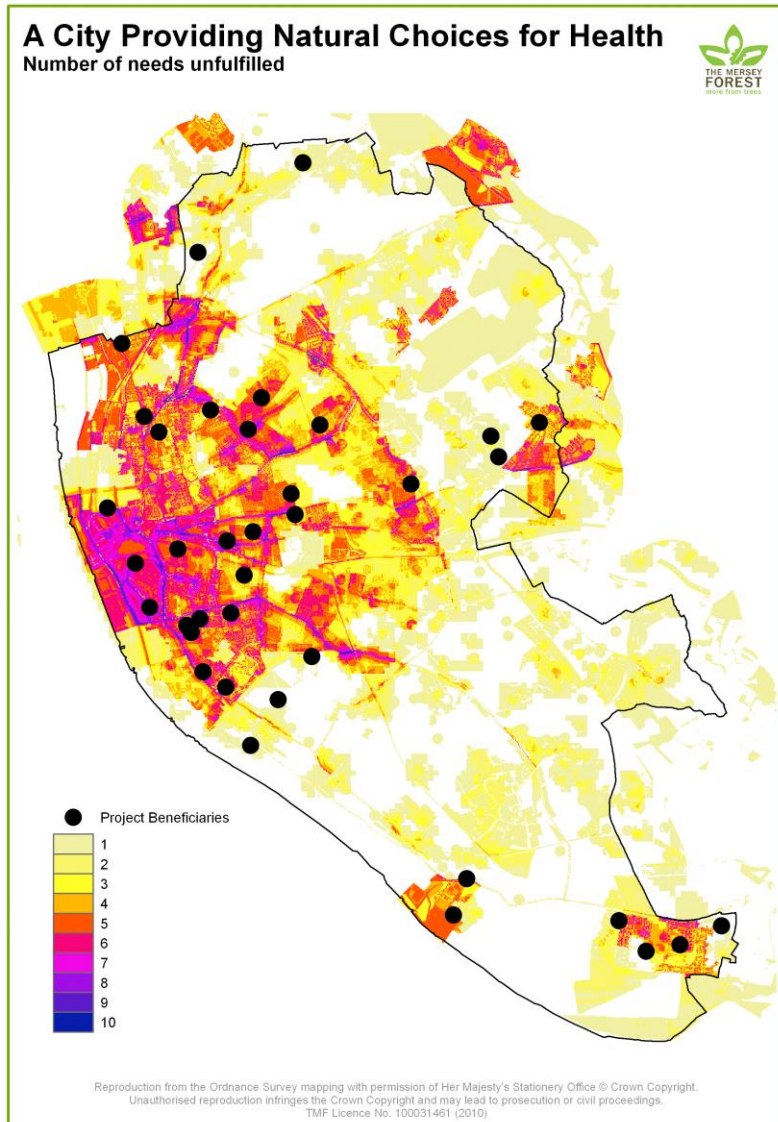
In just 44 weeks, 38 projects were delivered providing employment for 135 people, 867 volunteers and 100 partners to engage 3,274 participants. Some 43% of the projects primarily focused on gardening and food growing, with 29% on creating or improving the environment.

The Natural Choices programme demonstrated the following outcomes:

- Social cohesion and social capital were built
- Reduction in social isolation
- Increase in interest, engagement, and achievement of participants, including formal qualifications
- Improved self-esteem and overall wellbeing and mental health
- Increase in physical activity
- Partnerships between participant projects and with other agencies
- Lasting impact for participants and in some communities
- Improvements to local community environments
- Considerable social cost savings

The project had very low cost of £2.14 per participant per week – made possible by the significant dedication, voluntary effort and passion of the delivery organisations and individuals. Social cost savings were calculated which demonstrate a range of spending that can be avoided by these activities, and costs for mental ill health, for example, which could be either avoided, or redirected to achieve greater return on investment through these innovations.

Map 5: Successful targeting of green infrastructure projects in areas of greatest health need





Mersey Forest Delivering its Health Objective

The original cost benefits analysis for The Mersey Forest, carried out in 2001 for the Treasury, included an economic assessment of the increase in recreation provided by the creation of new community woodlands close to where people live⁴⁴.

In the Mersey Forest there have been a series of specific health-related projects and programmes including:

- REACT
- Forest School and health related projects
- Access to Nature
- Natutral Choices⁴⁵

The Mersey Forest Partnership has developed three related approaches to improving health and wellbeing through environmental action:

More people, more active, more often: general, non-targeted promotion of activity and use of woodlands across The Mersey Forest for recreation, leisure and general enjoyment as well as health benefits.

Passive benefits: promoting the passive benefits - the benefits that we receive by merely having trees in our landscape or neighbourhood, that require no active engagement from communities.

Targeted action: Use of the natural environment for specific health conditions, developing products as part of a " Natural Health Service".

⁴⁴ Adriam Whiteman, Community Forest Cost Benefit Anlaysis, 1990

⁴⁵ A project funded by the Liverpool PCT, as a result of the Liverpool GI Strategy and its focus on the role of GI in helping to improve wellbeing and tackle health inequalities

More people, More Active, More Often

Reflecting the early focus of the Community Forests, including Mersey Forest, the Partnership has increased the amount of accessible woodland. In total over 9 million new trees have been planted, creating 3,000 ha of new woodland and increasing accessible woodland by 150%. The aim is to provide opportunities for more people to use the natural environment for leisure activities, more often.

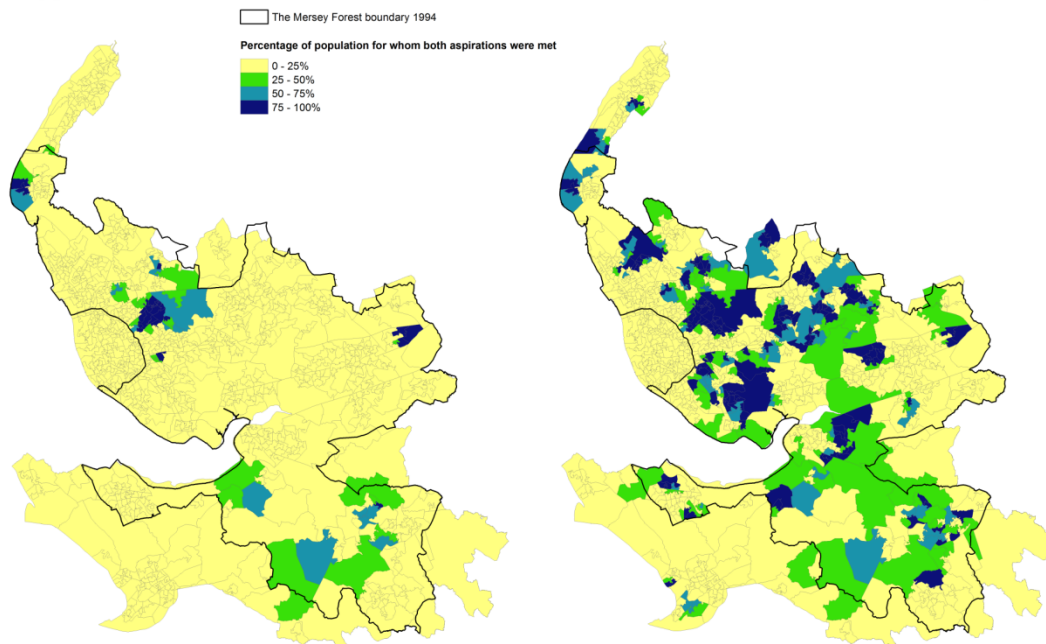
The increasing recreational use of these woodlands, measured through an independent survey, is valued at over £250m and may lead to the equivalent of 14 lives saved each year.

Figure 13 below shows the increase in accessibility of woodlands for communities. This accessibility is measured using the Woodland Trust's "Woods for People" standard.

Woodland Access Standard

1991

2012



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Figure 13 Woodland Access Standard from The Mersey Forest Plan

This increase in access to new community woodlands has also been targeted at the most deprived communities across The Mersey Forest area; areas where health inequalities are most pronounced.



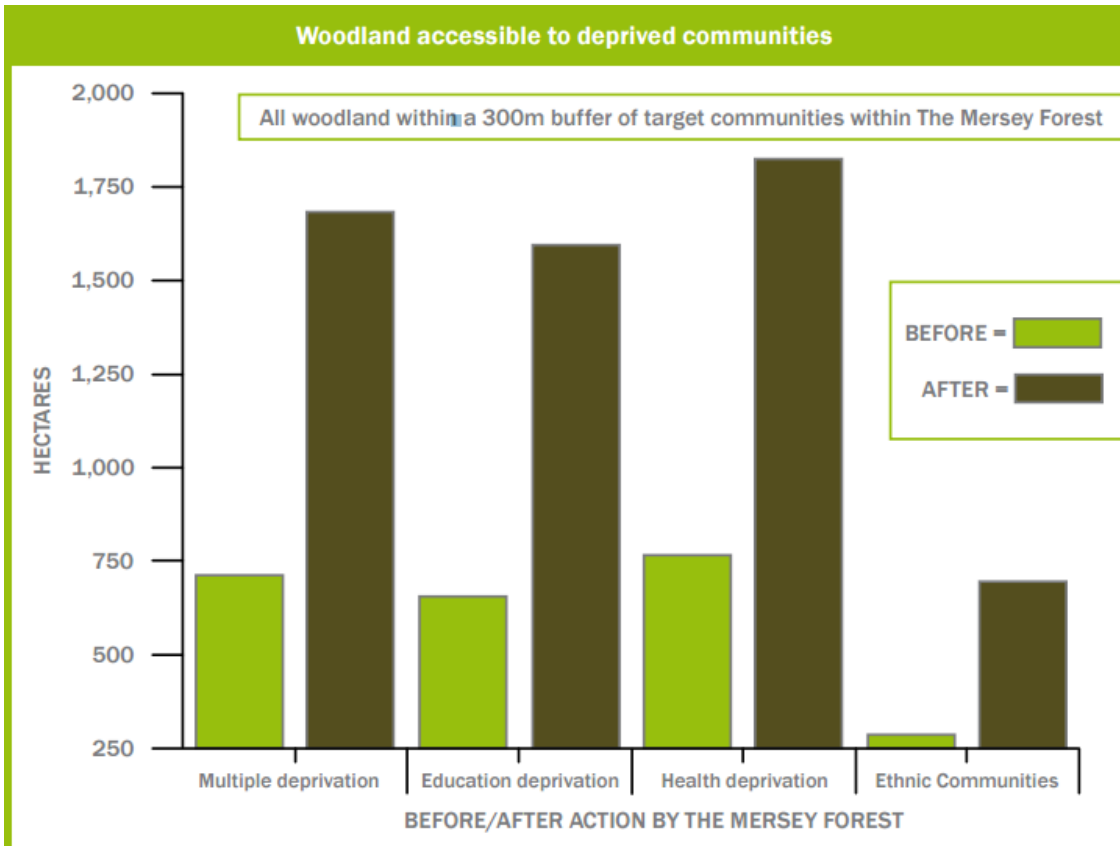


Figure 14 Comparison of community woodland in priority areas before and after the approval of The Mersey Forest

The area of woodland in our most deprived communities has increased by 3-4 times, providing opportunities for increased physical activity as well as the development of community groups and community based activity.

Promotion of Mersey Forest sites through events and campaigns and websites, such as “Discover the Mersey Forest”, help to continue to increase use as the new forest areas develop.

Passive Benefits

Our second strand of activity focuses on the passive health benefits of trees and woodlands. In simple terms, these are the benefits that trees and woodlands provide by simply being there! These benefits include:

- Reducing air pollution, removing some NO_x, PM10s and other potentially harmful pollutants from the atmosphere
- Reducing noise pollution
- Passive psychological benefits from green environments
- Climate adaptation – cooling air temperatures in heatwave conditions, reducing water runoff and so flood risk

For example, trees in our urban areas can contribute to reducing the impacts of heatwave on vulnerable communities by the cooling of air that they provide through the process of evapotranspiration. The UK Heat Wave strategy, described above, identifies the need for more green space as part of the long-term measures that can be delivered now to reduce the impacts of future heatwave events⁴⁶.



Figure 15 models the projected change in surface temperature in heatwave situations when tree cover is either increased or decreased by 10%. Increasing temperatures, particularly at night in heatwave events, leads to increased death rates - in particular amongst older and younger people, those with chronic ill health and other disabilities.

⁴⁶ The 2006 heatwave in Europe caused an estimated 30,000 deaths; the 2010 heatwave in Russia, 50,000

Maximum surface temperatures on a hot summer's day

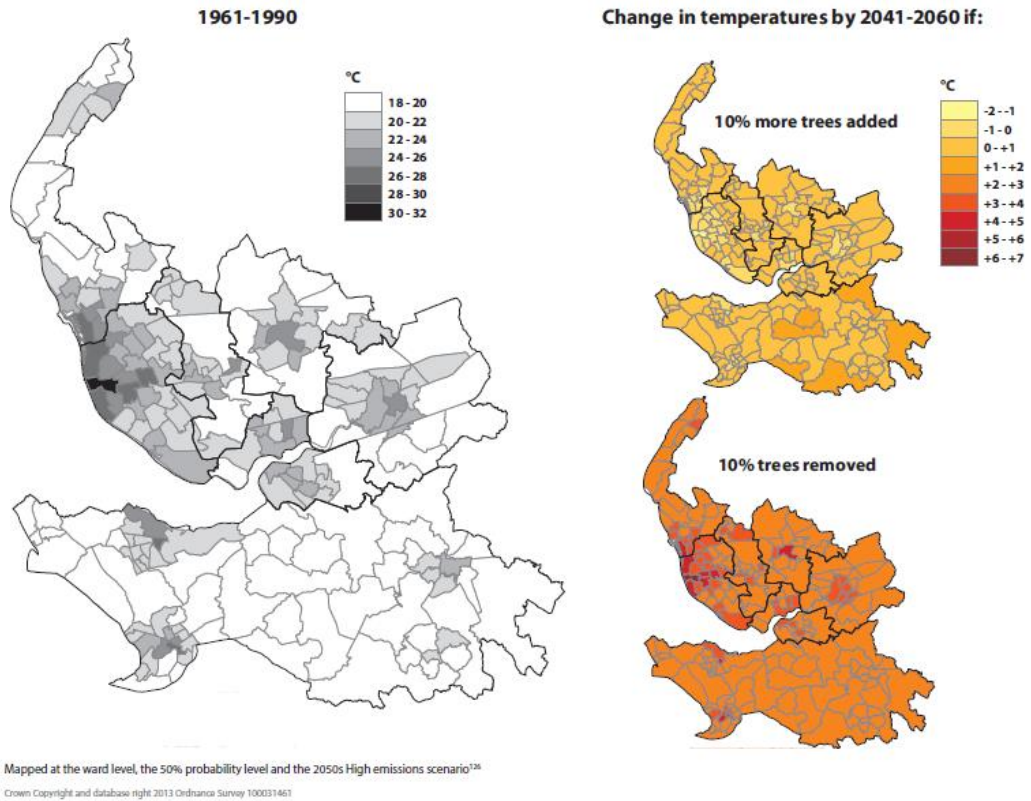


Figure 15 The Mersey Forest Team used the STAR tools to show the impact in maximum surface temperatures on a hot summer's day - the model was run for an addition or a removal of 10% of the existing tree cover.



Targeted Products delivered through “The Natural Health Service”

The two strands briefly discussed above are non-targeted in many ways. The use of Community Woodland sites is open to anyone, and the improved image of the area can be appreciated by anyone living, working or travelling through the area.

The third strand of activity is targeted at areas and populations who could perhaps benefit most regarding improving their health and wellbeing and/or reducing inequalities in health.

The Natural Health Service is our attempt to do this. Over the past three years, Mersey Forest Team has invested time and funding into developing a new, collaborative approach to delivering a range of “products” that use the natural environment as the basis for their delivery and effectiveness.

The Natural Health Service attempts to build up knowledge and understanding, to have a consistent approach built on a developing evidence base, with strong links to academia. It is targeted on the issues that are of most concern to health commissioners: tackling specific health conditions; in target populations and using NHS standard assessment criteria to demonstrate impact.

- **Overall goal:** To improve mental and physical health and reduce health inequalities by increasing access to and use of the natural environment.
- **Project aim:** To support the development of a robust business case and provider consortium to deliver quality and effective Natural Health Service products to health commissioners.
- **Project need:** All nine Joint Strategic Needs Assessments in the Mersey Forest prioritise CVD, 7/9 healthy weight, 7/9 self-harm in young people, 6/9 Health & Wellbeing strategies prioritise mental health, 4/9 target dementia.

The Service focuses on the delivery of a small number of “products”; interventions that have a sound evidence base, targeted at specific conditions. The aim is to mimic in some ways the products that are available elsewhere in the National Health Service, whether that be drugs or other forms of therapy. For each of these Natural Health Service products, we are developing a “Product Sheet” that sets out the nature of the product, the conditions that it may be used for, the evidence of its effectiveness and some case studies to show how it has been used to date, either locally or more widely in the UK.



The Service also aims to bring organisations that share a similar approach, or want to develop nature-based approaches, together into a consortium. The purpose of the consortium is to improve the quality of the products more quickly through information sharing and research and also to gain a critical mass of activity to enable effective engagement with commissioners of health services and delivery of services across The Mersey Forest and perhaps beyond.

The consortium is made up of a range of organisations that can be split into four categories:

- Landowners - who wish to see their land used for health activity
- Product deliverers – who may not own land but will deliver one, some or all of the products
- Policy developers – who take the learning from the consortium and use it to inform and influence policy
- Infrastructure – co-ordination and promotion of the Natural Health Service

The Mersey Forest Team acts as the infrastructure organisation, co-ordinating activity and investing in the development of the Natural Health Service, as well as making links to new consortium members and promoting the Natural Health Service.

The Natural Health Service approach has been trialled in some locations over the past 18 months, with lessons learnt informing the development of the Service and Products.

Over the past year the focus for the Natural Health Service has been:

- Winning funding to extend the Natural Health Service approach
- Developing the research element of the service, to become a” Centre of Excellence” for research into the Natural Health Service
- Identifying the Social Return on Investment from the Natural Health Service, based on the pilot work that has taken place in Halton, Knowsley, Liverpool and Cheshire West and Chester



Winning Resources

In June 2015, Reaching Communities awarded £420,000 to the Nature4Health project. Nature4Health focused on tackling health inequalities across The Mersey Forest, using some of the products developed for the Natural Health Service.

The aim is to offer and deliver interventions that will:

- Support communities across The Mersey Forest experiencing health inequalities
- Enable residents to feel well and to recognize and fulfil more of their potential throughout their lives
- Create greener places which have a healthy environment, a lower carbon footprint, attract people to live and invest and are resilient to change
- Engage and provide support and new skills for local people to volunteer to help shape and deliver the project increasing confidence and employability, whilst developing progression routes for activity which supports health and wellbeing activities within the natural environment

Nature4Health will deliver:

- A range of different activities undertaken with over 2,000 participants
- Over 75 volunteers trained and supported
- A support network established to provide peer support, information and signposting to inform and support participants
- High quality and meaningful evaluation reports to the Big Lottery, participants and public health professionals, as well as peer-reviewed academic research

By the end of the project, children and adults will have increased self-esteem and confidence; and will be more active and have developed better coping strategies showing an increased resilience reducing the need for medical interventions.

The target outcomes are summarised in the table below.

Outcomes
<p>Outcome 1</p> <p>Increased self-esteem and confidence.</p>
<p>Outcome 2:</p> <p>Children and adults are more active, improving physical health and wellbeing, reducing their risk of illness and aiding recovery.</p>
<p>Outcome 3</p> <p>Improved mental health for children and adults and reduced likelihood of developing or advancing certain mental health conditions.</p>
<p>Outcome 4</p> <p>Improved knowledge and skills, coping strategies and increased resilience for participants.</p>

Figure 16 Nature4Health outcome framework

We also hope that this exciting project will help to build the case for a commissioned service across a large area of the Mersey Forest, supporting a developing, professional consortium of partners to help tackle some of the most pressing health and wellbeing issues in the area.



Developing Research

The Mersey Forest Team has always worked closely with local, national and international universities. The relationship has been very positive; the Forest Partnership receives first class research from top universities, and excellent students working with the team (many of whom have gone on to work with the Forest Team or locally in the sector). The universities benefit from the “living laboratory” for new projects and new ways of delivering projects, providing scope for PhD, MSc and undergraduate study.



The Forest Team has a long established relationship with the Centre for Exercise and Sports Science at Liverpool John Moores University (LJMU). The initial work on the impacts of Forest School on children's behaviour was carried out in 2008.

This work has developed and evolved over time and we have more recently worked closely with Liverpool University, Dept. of Psychology, looking in particular at Mindful Contact with Nature.

More recently we have worked with both Liverpool universities, the Heseltine Institute, the North West Coast Academic Health Science Network (NWC AHSN) and Exeter University to start to develop a Centre of Excellence for research on the Natural Health Service. The research sits alongside the delivery of products, delivering high quality independent research to inform the delivery and development of The Natural Health Service. We see this as an important element in the structure of The Natural Health Service.

A criticism of “green exercise” programmes has been a lack of robust research, and particularly a lack of long term studies⁴⁷. The aim of the joint work with the universities is, over time, to start to address the gaps in research and build up a consistent and long term programme of research that can improve the practice of the Natural Health Service and provide information to others across the country who may be looking to develop similar programmes, or who wish to adopt the Natural Health Service approach.

The following is a very brief summary of some of the findings from the collaboration with the Universities to date:

Study	Year	Main Findings	Reference/link
Natural Play in the Forest: Forest School Evaluation (Children) Report 1 of 2	2010	A report produced for Natural England. Nicola D Ridgers & Jo Sayers.	 View PDF (2.54 MB)
Natural Play in the Forest: Forest School Evaluation	2010	A report produced for Natural England.	 View PDF (2.15 MB)

⁴⁷ http://www.hegroup.org.uk/images/resources/Physical_Activity_Green_Space_Health_Report.pdf







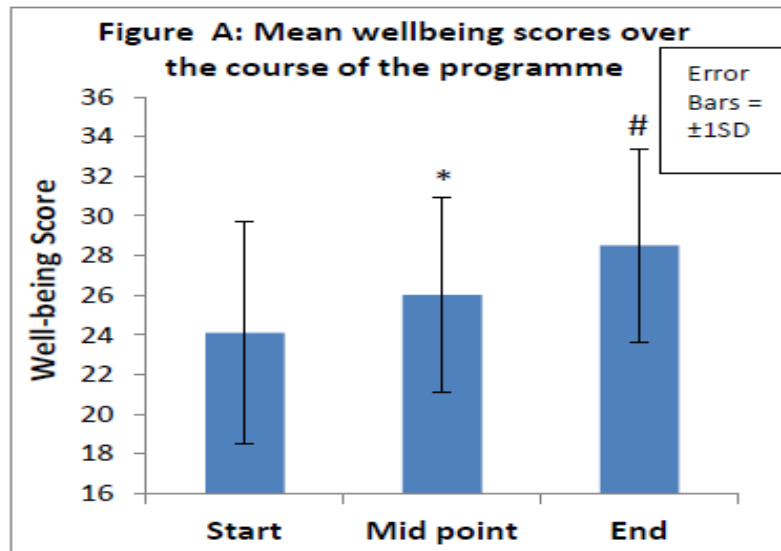
(Families) Report 2 of 2			
Encouraging Play in the Natural Environment	2012	Child-focused case study of Forest Schools.	 View PDF document (853.85 KB)
Natural Choices	2012	This summary document describes the work of almost 40 projects involved in the Natural Choices for Health and Wellbeing Project in Liverpool over the course of 2012.	 View report (3.86 MB)
Mindfulness Practice in Woods and Forests: An Evidence Review	2013	A report by Forest Research, commissioned by The Mersey Forest, about the evidence base for mindfulness within forestry and woodlands.	 View report (1.32 MB)
Evaluation of Forest School as part of the Natural Health Service	2015	Positive and significant increases in physical activity identified. Positive attitude to Forest School identified through mixed methods research.	 View Report (468.55 KB)
Natural Health Service Pilot - Halton	2015	For the non Forest School activities (separate study listed above) in the Halton pilot. Trends of increased activity and wellbeing improvements were identified, but low numbers recruited onto the study reduced the ability to identify any statistically significant changes for participants in the study group.	 View report (212.33 KB)
Knowsley Parks and Greenspace Evaluation	2015	Positive trends in physical activity and mental wellbeing identified across a range of sites in Knowsley.	 View report (176.96 KB)

Figure 17 Research on health and wellbeing through The Mersey Forest

The study by Essex University on the outputs from the Natural Choices programme indicated a statistically significant, 18% increase on average, in the wellbeing score of participants, measured by Wemwebs.



(*indicates a significant difference between start and midpoint scores ($P < 0.01$), # indicates a significant difference between start and end, and start and midpoint scores ($P < 0.001$)).

Figure 18 Overview of mean wellbeing scores of participants in Natural Choices programme

The most recent work on the activity levels of primary school children in Forest School compared to days when children had PE lessons, weekend days and days with no PE Lesson perhaps indicates the value of this work with the universities.

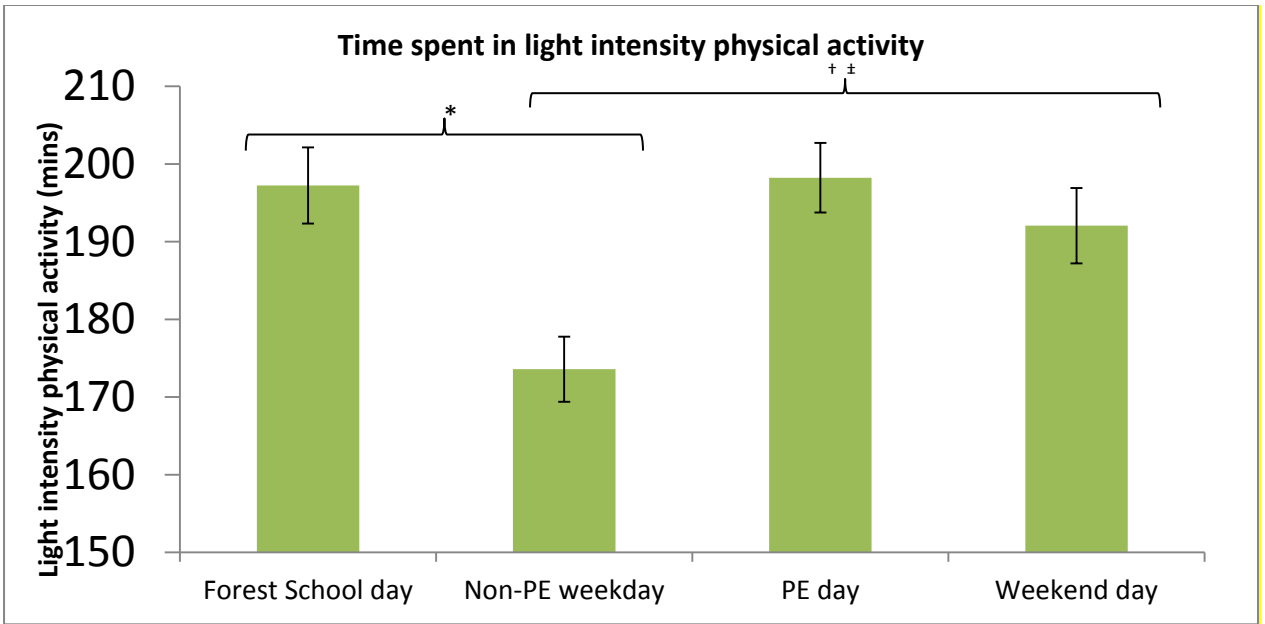


Figure 19 Comparison of light physical activity duration for different days of the week.

The study, carried out with four schools in Halton, showed that levels of activity on Forest School days were equivalent to PE days, with both showing statistically significant increases in physical activity over non-PE days.

Further analysis showed that children with a BMI of over 25, both male and female, showed the greatest level of physical activity increase in Forest School days.



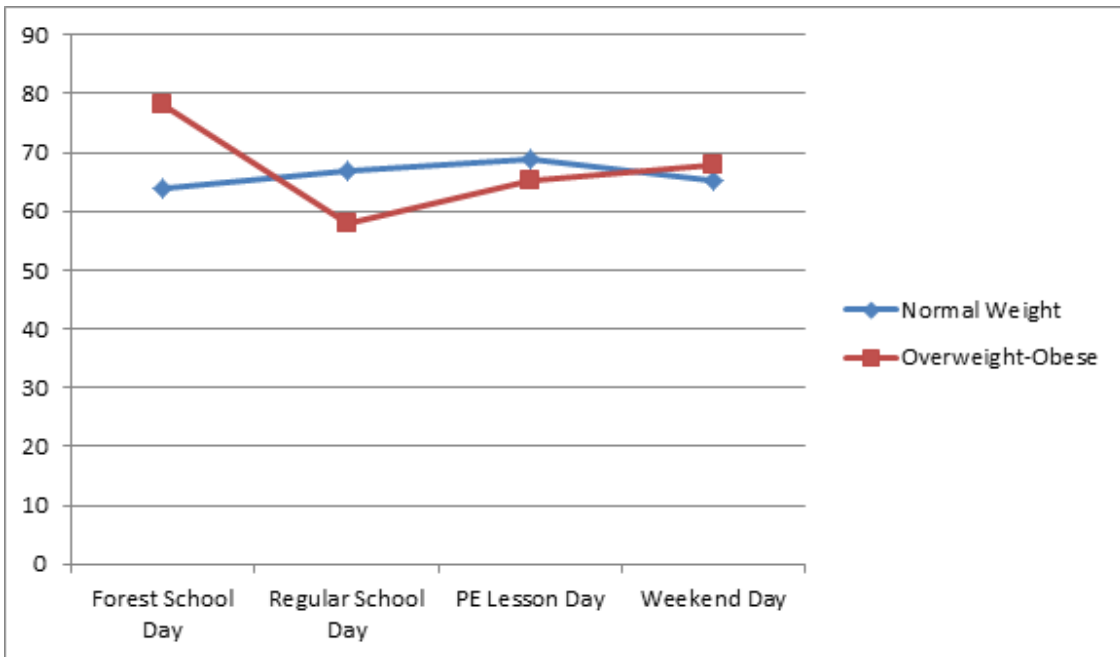


Figure 20 Comparison of activity levels of children of normal weight and overweight-obese

These results point to the possibility of Forest School not only helping to improve education attainment but also helping to increase physical activity levels, with those children with higher BMI benefitting most.

The other activities piloted in Halton showed less positive results. This was partly due to the low sample size, in part due to the reluctance of participants to take part in the research. However, in the first pilots for the consortium it was also found that the communication from management to front-line delivery staff for some products was not always clear. The Service can learn from this to ensure that the point of contact with people is always the most knowledgeable about the service, products protocols, standards and evaluation.

Social Return on Investment

Social Return on Investment (SROI) is a framework for measuring and accounting for a concept of value that incorporates social, environmental and economic costs and benefits. SROI measures change in ways that are relevant to the people or organisations that experience or contribute to it. It tells the story of how change is created by measuring social, environmental and economic outcomes and uses monetary values to represent them. This enables a ratio of benefits to costs to be calculated.

Funded by Social Investment Business (SIB), Cogent Ventures carried out research to look at the SROI of the Natural Health Service.

The research involved a wide range of interviews with service deliverers, participants and potential commissioners.

A primary purpose of the analysis was to support the case for the expansion of Natural Health Services and to help commissioners justify future investment. A further purpose of the analysis is to ensure that both the design of the service and how the service is delivered are rooted in achieving outcomes that future participants and health and social care commissioners want.

Using existing models, business plans and other financial data costs and returns on investment were calculated for the Natural Health Service.

To calculate overall impact, outcome values were then reduced to reflect deadweight, attribution and displacement.

The social return on investment for the Natural Health Service was calculated by Cogent to be £6.75 for every £1 invested.



Figure 21 Social Return on Investment from the Natural Health Service



What next?

The Natural Health Service finds itself at an important stage in its development:

- The policy support is in place at both national and local level.
- The evidence base, while still developing, continues to indicate a positive health impact of interventions that make the use of green spaces as a fundamental element of the “product”.
- Excellent local case studies and pilot programmes have delivered positive results, cost effectively.
- The independent SROI assessment indicates that the Natural Health Service costs effective.
- There is a developing consortium of practitioners.
- We have a “Centre of Research Excellence”.
- Reaching Communities funding of Nature4Health will allow further work on reducing health inequalities and improve our evidence base locally.

The task now is to translate all of this potential into a long-term programme that is supported financially and sees a transformation in the way in which we view our green spaces.

In many ways, it is a journey back to the early days of public health, with a clear link between health, green spaces and spatial planning. In other ways it is a journey into the unknown; a future of demographic and population shift, austerity, climate change and changing lifestyles.

A Natural Health Service is not a panacea, just as the National Health Service will not be, but it can be part of a plan that embraces all elements of the wider determinants of health to create places that support good health and provide for the wellbeing of our communities.