# Links between natural environments and obesity: evidence briefing

## Purpose of briefing

**This briefing note is part of a series that summarises evidence of the relationships between the natural environment and a range of outcomes. This briefing focuses on links between the natural environment and obesity. The notes are aimed at: policy makers, practitioners, practice enablers (including Natural England and Natural Resources Wales), local decision makers, and the wider research community. They highlight some of the implications for future policy, service delivery and research. It is intended they will inform practitioner planning, targeting and rationales, but not the identification of solutions or design of interventions. Barriers to access or use are not considered in these notes. The other briefings in the series published so far cover physical activity, mental health, physiological health, connection with nature, and learning. The notes consider evidence of relevance to the UK and outcomes for both adults and children. Please see EIN016 for methodology, glossary and evaluation resources.**

## Extent of the issue

- Obesity has serious implications for both physical and mental health, increasing the risk of health conditions such as type II diabetes, some cancers, heart disease, stroke, depression and anxiety.
- Many factors influence a person's body weight including diet, physical activity and the environment in which we live, work and socialise in. Weight gain results from an imbalance between energy consumed and energy expended, and eating less is crucial for weight loss. Increasing physical activity levels helps to maintain a healthy body weight and support weight loss when combined with a reduction in calorie intake [1].
- The proportion of people who were categorised as obese (BMI 30kg/m2 or over) increased from 13.2% of men in 1993 to 24.3% in 2014 and from 16.4% of women in 1993 to 26.8% in 2014. Data from the National Child Measurement Programme for 2014-15 show the proportion of obese children aged 4-5 is 9.1%.
- Excess weight costs the NHS more than £6.1bn each year and is estimated to lead to lost earnings of around £2.35bn-£2.6bn a year [3].
- By 2050 it is estimated that the costs of overweight and obesity to society and the economy may reach £50bn [1].

## Summary statement

There is a moderate quantity of evidence (of varying reliability, with a number of peer reviewed systematic reviews), which suggests that there is a positive (though usually weak) association between natural environments and rates

or prevalence of obesity and overweight in adults and children. There is some evidence that the impacts vary according to socio-demographic group. There is little evidence which demonstrates the effectiveness of different intervention options. The available evidence is *indicative* of a relationship, further robust studies are needed to better understand associations and causal pathways between natural environments and obesity.

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## Review of the evidence

### Is there an association between the amount of greenspace in the living environment and rates of obesity?

Having *greater* amounts of greenspace around the home has been shown to be associated with reduced rates and likelihood of overweight and obesity in local populations, however the evidence is not consistent with some studies failing to find the relationship.

- A study of several European countries found that the likelihood of obesity was around 40% lower for those living in residential environment with high levels of green features [4, 5].
- Research from the UK and Canada was inconclusive, finding no significant association between greater amounts of greenspace around the home and rates of obesity [6, 7].

### Is there an association between living near greenspaces and lower rates of obesity?

The evidence as to whether living *nearer* greenspaces leads to reduced likelihood of obesity and overweight is also mixed, some studies find a positive association while others find no relationship.

- A study focusing on residents of Bristol showed that living further away from greenspaces was associated with greater likelihood of obesity, however this relationship was lost after other factors which may influence weight outcomes, such as socio-economic status, were accounted for [8]. However, the study found that the people who lived closest to parks were most likely to achieve the national physical activity recommendations [8].
- A Finnish study found living >750m versus <250m from ‘usable’ natural environments significantly increased the odds of overweight (though this was not significant for obesity) and that moving to a house which was further away from natural environments than the previous house was associated with increased odds of obesity [5]. Similar relationships have also been demonstrated in adults and children in Australia [9] and the USA [10, 11].

### Does the use of natural environments lead to reduced likelihood of obesity?

There is some evidence to show that people who actually use local natural environments tend to have lower rates of overweight and obesity (the evidence in the previous two sections did not assess whether people ‘used’ natural environments in any way just the total amount and proximity) [8]. However other studies, including longitudinal analyses from the UK, have failed to find positive associations between use of greenspaces and weight status [12].

- An English study showed that those who used local greenspaces less than once a week were significantly more likely to be overweight or obese, even after rates of total physical activity were considered, than those using them more often [13].

## Do the associations between natural environments and obesity vary between different groups of people?

Relationships between natural environments and obesity appear to differ within populations according to factors such as age, gender and socio-economic status, these patterns appear to differ between studies.

- Gender - Australian research found that neighbourhood natural environments had some protective effect against obesity in older women but not for men [14]. Research from the USA found that although rates of obesity in childhood were lower amongst all those living closest to greater amounts of public park the effect was strongest for boys [10].
- Age - Further Australian research found that age was an important factor, and the protective effect of living in greener environments in childhood appeared to become more important with increasing age [15].
- Ethnicity - Research from the USA found the strongest associations between greater access to greenspaces and a lower likelihood of obesity amongst black children [16].

## Do natural environments have an impact on obesity related health inequalities?

No specific evidence was found that considered the impact of natural environments on obesity and overweight related health inequalities.

## What is the impact of the type or quality of natural environment on obesity?

There is little information regarding the impact of the type or quality of the natural environment on weight status. Much of the evidence reviewed above did not discriminate between natural environment type (e.g. woodland, urban park, or coastal areas) or quality (e.g. how biodiverse it was, or the presence of litter etc.).

- A study focusing on Bristol found a significant association between lower rates of obesity and greater access to ‘formal’ and ‘informal’ greenspaces but not for other designations (natural, young people's spaces or sports) [8].
- A systematic review reported positive associations between lower rates of overweight and access to beaches in New Zealand and park based play grounds for children in Canada [17].

## What are the outcomes of specific interventions?

There is little consistent evidence which relates to the obesity outcomes of environmental interventions (either changes to the environment or encouragement/facilitation of the use of the environment).

- An American study of environmental change (including increased quantity of greenspaces) in an urban setting found no significant association with the weight status of older women [18].
- A systematic review of the health outcomes of walking groups (many of which take place in natural environments) found participation resulted in significant reduction in body weight though not waist circumference [19]. A systematic review of conservation activities found no significant impacts on weight status [20].

## What is the cost effectiveness of interventions?

No evidence relating to the cost-activeness of obesity or overweight focused natural environment interventions was found.



## Implications for policy, service delivery and research

### Policy and service delivery

- The small body of evidence, which while occasionally contradictory and not yet conclusive, suggests that there may be value in increasing the quantity and accessibility of good quality safe urban greenspaces as a means to contribute to tackling overweight and obesity [17, 13]. This could be achieved, for example, through strengthening the planning recommendations regarding the quantity of natural spaces within living environments [17].
- Any interventions, policies and programmes should be suitably targeted to reduce risk of enhancing obesity related health and social inequality [15]. Tackling obesity is complex [1] the use of theoretical frameworks and theory of change models would enhance intervention design.

### Research

- Planners and other spatial decision makers would benefit from greater evidence as to the influence of the type and quality of natural environments on weight status [21] with guidelines on what is 'enough green' within the living environment to lead to positive weight related outcomes [15].
- There is a need to better understand: causality, cost-effectiveness, variation in any outcomes, and potential to ameliorate or exacerbate health inequalities [8, 17, 22]; the influence of the type and quality of natural environments on weight status [21]; and the role of other important mediating factors (e.g. social support, compensatory behaviours etc.) [22].
- As many interventions are essentially complex and often part of wider programmes of activity, evaluators should consider application of the principles of the Medical Research Council's '*Complex Intervention Guidance*' to better define interventions and understand process and outcomes [23, 24]. Future evaluations should seek to clarify 'what works, when and for whom' [25]. There is potential to make links with the new **Centre for the Evaluation of Complexity Across the Nexus**.
- Good quality evaluations, using robust methodologies with rigorous reporting, should be integrated into future greenspace interventions. It would be of value to gather, using robust and reliable indicators, information on the programme, delivery, participants or population receiving it, environment and outcomes that are suitable to a) inform future activity and b) allow for synthesis of findings [22].

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## Further information

Natural England evidence publications can be downloaded from the publications and products catalogue: **http://publications.naturalengland.org.uk/**. For information on Natural England evidence publications contact the Natural England Enquiry Service on 0845 600 3078 or e-mail **enquiries@naturalengland.org.uk**.

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