

Evidence Statement on the links between natural environments and human health

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These slides summarise an [evidence statement](#) produced by [Defra](#) and the [University of Exeter Medical School](#). It provides a broad overview of evidence on the links between natural environments and human health; first summarising global, landscape scale and other indirect links between natural environments and human health, then focusing in more detail on the direct benefits to health and wellbeing at the individual and population level. Mechanisms of action, pathways, influencing factors, monetary values and policy options are also reviewed.

The evidence statement makes use of higher order evidence such as peer-reviewed systematic reviews and other robust forms of evidence where possible, but was not itself systematic.



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Overall strength and quality of the evidence

		Quality of evidence	
		Evidence largely from peer-reviewed systematic or non-systematic reviews or meta-analyses	Evidence largely from mixed evidence sources, individual journal articles and reports, or sources that have not been peer reviewed
Strength of links between natural environments and human health	Strong evidence	<ul style="list-style-type: none"> Mental health and wellbeing Development and maintenance of a healthy immune system and reduction of inflammatory-based diseases 	<ul style="list-style-type: none"> Variation between social and demographic groups
	Generally positive links	<ul style="list-style-type: none"> Landscape, ecosystem and city scale linkages Physical activity (in selected groups or according to specific use types) 	<ul style="list-style-type: none"> Perceived health status Mortality Maternal health, pregnancy outcomes and children's cognitive development Other physiological outcomes Social contact and community cohesion
	Evidence is mixed or unclear	<ul style="list-style-type: none"> Global ecosystem services, biodiversity and health Physical activity (at population level) The effectiveness of existing policy and interventions 	<ul style="list-style-type: none"> Obesity Environmental quality The type of natural environment Exposure mode, duration and a dose-response relationship The monetary value of benefits Future policy and delivery options



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Global ecosystem services, landscape scale and other indirect links between natural environments and human health

- Human health and wellbeing depends on air, food, shelter and water, all partly or fully derived from the natural environment. Evidence indicates that **biodiversity** is critical to underpin **ecosystem functioning** and the delivery of goods and services that are essential to human health and wellbeing.
- Evidence demonstrates interlinkages between **landscape scale processes** and human health outcomes. At **catchment level**, analyses show how upstream processes, such as water retention in upland peat, can have significant implications for the health of downstream communities, for instance through the avoidance of flooding and improved water quality. **Green infrastructure** within urban areas offers a range of health related services including reductions to noise, ozone levels, personal exposure to particulates, and mitigation of some of the harmful effects of air pollution, as well as opportunities for direct exposure to nature.

Direct links between natural environments and human health at the individual and population level

- There is consistent, robust evidence to show that living in greener environments (e.g. greater percentage of natural features around the residence) is associated with reduced rates of **mortality**.
- Evidence suggests that **socio-economic inequalities in health** are narrowest for those living in greener environments.
- There is relatively strong and consistent evidence for the **mental health** benefits arising from exposure to natural environments, including reductions in stress, fatigue, anxiety and depression, particularly for marginalised groups.
- Rates of **obesity** tend to be lower in populations living in greener environments.
- Exposure to natural environments has been linked with the development of a healthy **microbiome** - key to the maintenance of a **healthy immune system** and reduced rates of **inflammatory-based diseases** - and with more favourable: **heart rate**; **blood pressure**; **vitamin D levels**; **recuperation rates**; **maternal outcomes**; and with a reduced prevalence of **type 2 diabetes**.

Pathways and influencing factors

- Natural environments are associated with and may support higher levels of **physical activity**.
- Positive relationships have been found between **social contact and community cohesion** and natural environments.
- Variation has been found in the health outcomes associated with exposure, between physical and psychological **perceptions of accessibility**, and in **motivations** for use of natural environments between **different social groups**. Although **lower socio-economic groups** are thought to disproportionately benefit from natural environments they often face the greatest barriers to use.
- Evidence suggests **higher quality** (biodiverse and/or well maintained) natural environments are associated with more positive health outcomes.
- Although much of the evidence relates to urban greenspace, exposure to or use of certain **types of natural environment** (e.g. broadleaf woodland, arable and horticulture, improved grassland, coastal) appear to result in greatest health gain.
- The majority of evidence shows that a greater **quantity and proximity** of natural environment (typically in relation to living environment) is consistently positively associated with health outcomes.

The monetary value of benefits

- A range of **favourable values** have been calculated to illustrate the value of health and wellbeing benefits derived from the natural environment. Evidence indicates that nature based interventions are likely to be **cost-effective**.

Policy and delivery options

- **Integrated policy and delivery** is required to help recognise and take account of multiple benefits.
- There is a need to **learn lessons from other sectors** and wider evidence on **influencing behaviours and securing transitions across systems**. Policy and delivery should aim to **encourage and enable people and organisations** to behave differently to improve health outcomes and benefit the natural environment.

Evidence gaps

- There is a need to: improve understanding of **causal links**; produce evidence suitable to **inform policy, service delivery** and the **design of interventions**; and to better understand how to **equitably maximise** the health benefits of contact with nature for all.

About the Evidence Statement

The evidence statement and the supporting technical appendix have been produced by Simon Maxwell, Environment Analysis Unit, Defra and Rebecca Lovell, Defra Research Fellow on the Natural Environment and Human Health at the European Centre for Environment and Human Health. The Fellowship was funded as part of Defra's Biodiversity and Ecosystems Evidence Programme. The [full evidence statement and technical appendix](#) are available from the Department's Science and Research Projects Database at <http://randd.defra.gov.uk> (Defra Project Code BE0109).

The [European Centre for Environment and Human Health](#) is an interdisciplinary centre, based in the [University of Exeter Medical School](#), which focuses on understanding the emerging threats to health and wellbeing posed by the environment, and the health and wellbeing benefits the natural environment can provide. Summary information on the statement can be found at <https://beyondgreenspace.net/2017/03/09/defra-evidence-statement-on-the-links-between-natural-environments-and-human-health>.

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