



IS THERE AN 'ADDED VALUE' OF ACTIVITY IN NATURE? AN ASSESSMENT OF THE EVIDENCE

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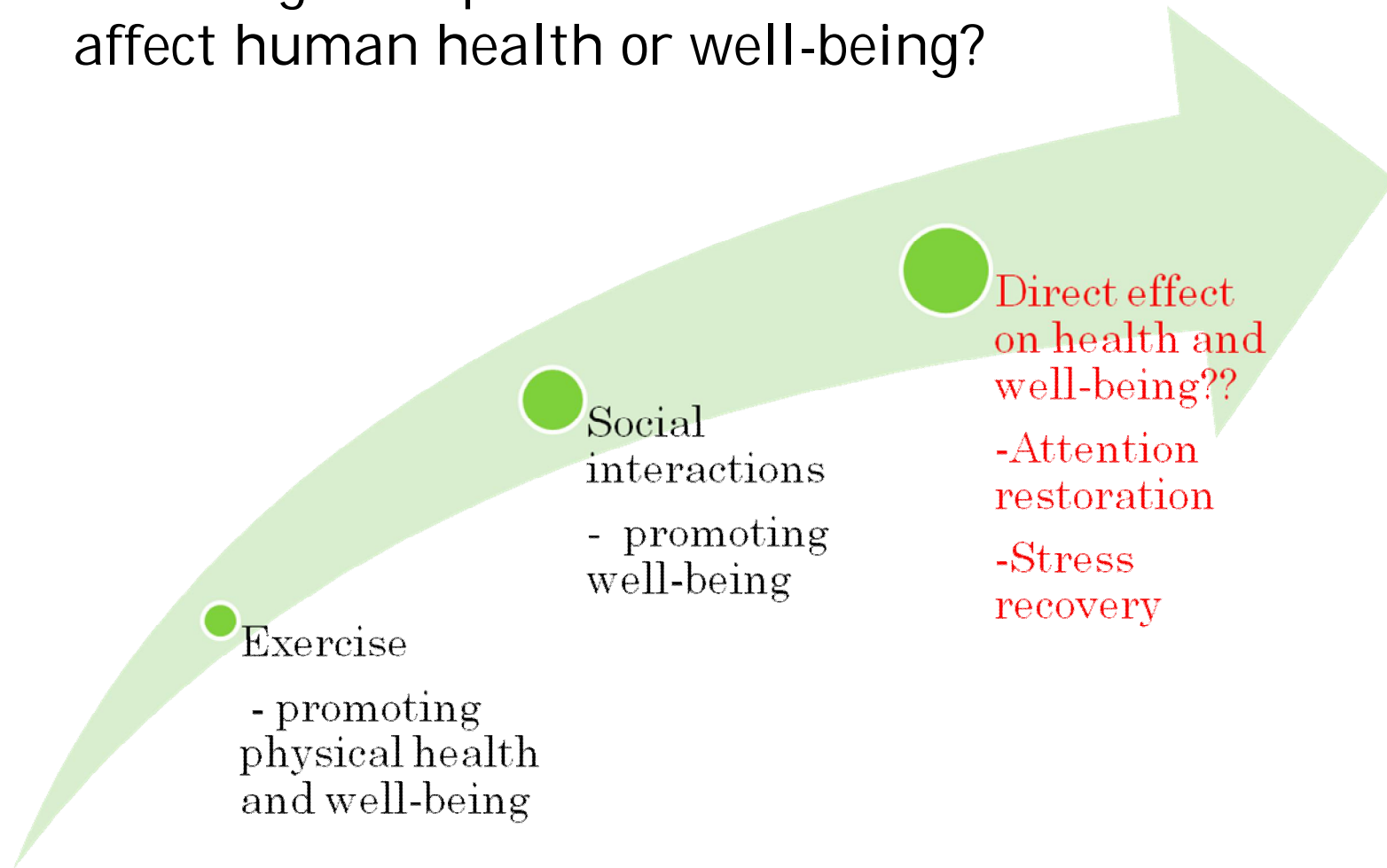
SIGNIFICANCE FOR PUBLIC HEALTH PROMOTION

- Natural environments may provide a free and accessible resource to promote health
- Using nature in this way may also promote the conservation of biodiversity and allow gains from other benefits of green space
- Lots of discussion.....many reviews on the links between nature and health have been written to date....
- But what science has been done?



THE THEORY

- How might “exposure” to a natural environment affect human health or well-being?



ASSESSING THE EVIDENCE

- Systematic review as a methodology to assess the available empirical evidence on the effects of an intervention
- Systematic review comprises:
 - Comprehensive search
 - Objective/predefined inclusion criteria
 - Critical appraisal of study methodology
 - Quantitative synthesis of study findings



LITERATURE SEARCH

- Searching for relevant data was conducted within 19 electronic libraries/databases.
- Articles were also searched using web search engines and within the websites of public health and environmental organisations.
- A range of activity/health/well-being words (e.g. exercise, health, restoration, depression) in combination with a range of environment words (e.g. park, green, outdoors, countryside) were used to search databases.



INCLUSION CRITERIA OF REVIEW

- Our review included studies that:
 - Measured an aspect of human health/wellbeing on a group of participants
 - After some activity in a natural environment
 - As well as after some activity in a non-natural environment (e.g. indoors, outdoor built)
 - Akin to a 'control' group – allows investigation of the difference between participating in an activity in different environments.



APPRAISAL AND SYNTHESIS

Extract data from each article on:

- Aspects of methodology:
 - Types of participants
 - How participants were selected
 - Whether other factors were controlled between environments
 - Validity of data collection tools
- Results
 - Data on health/well-being measurements necessary for meta-analysis (usually means and standard deviations)

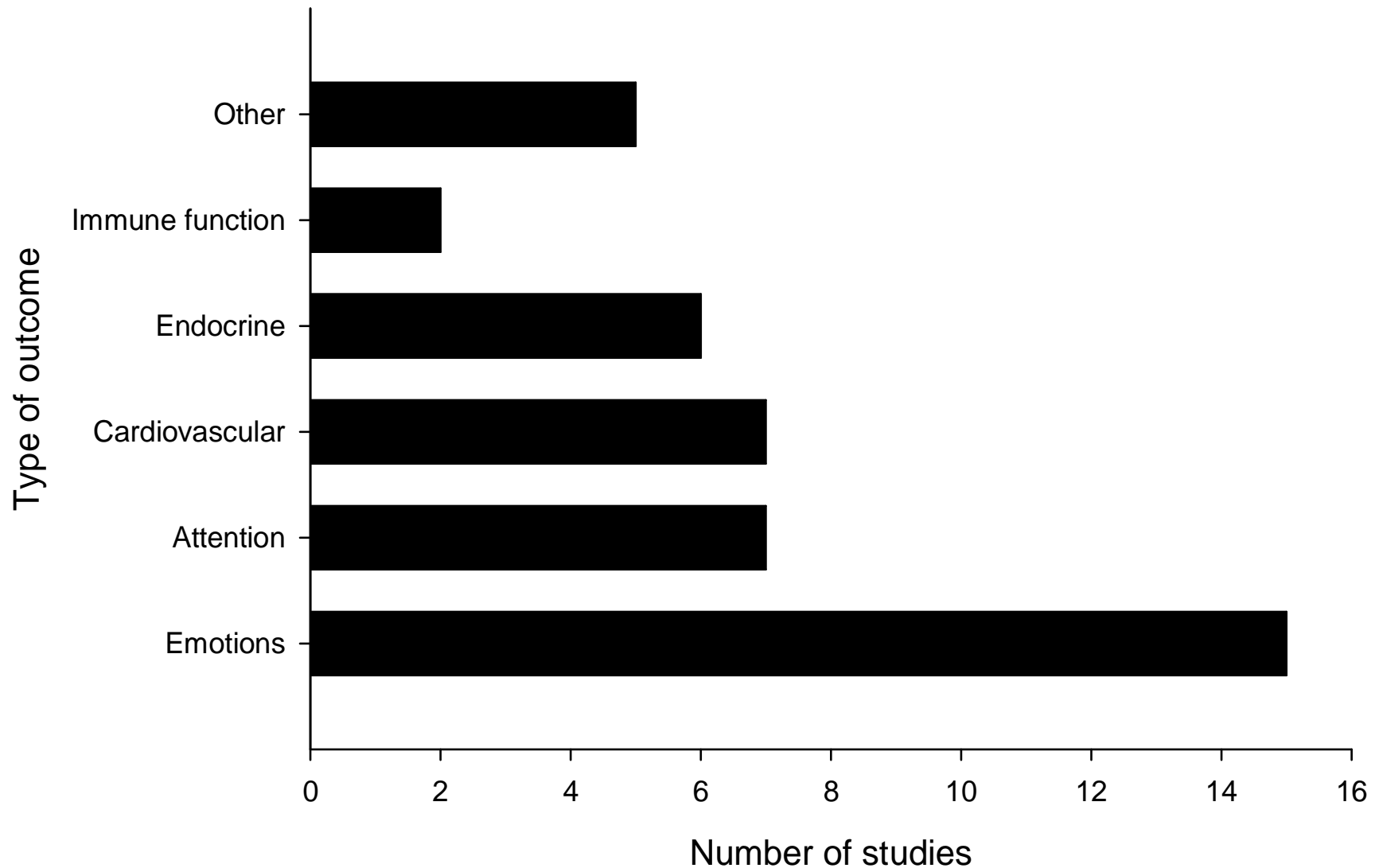


CHARACTERISTICS OF STUDIES

- 28 studies met the inclusion criteria.
- Most studies were cross-over trials or controlled trials of the effect of different environments during a walk or run
- Most studies were short-term (often less than 1 hr in each environment)
- Most studies were not investigating the effect of a public health intervention



TYPES OF OUTCOMES MEASURED BY STUDIES



STUDY RESULTS

- 'Effect size' summarises the results from a particular study
- The effect size in this review reflects the difference between health/wellbeing measures in natural and non-natural environments.
 - Positive effect sizes indicate that a natural environment has a more positive effect in comparison.
- Effect sizes from different studies were combined to estimate the overall average effect.



STUDY FINDINGS

Outcome

attention (4 studies)

energy (5 studies)

tranquility (7 studies)*

anxiety (6 studies)*

anger (7 studies)

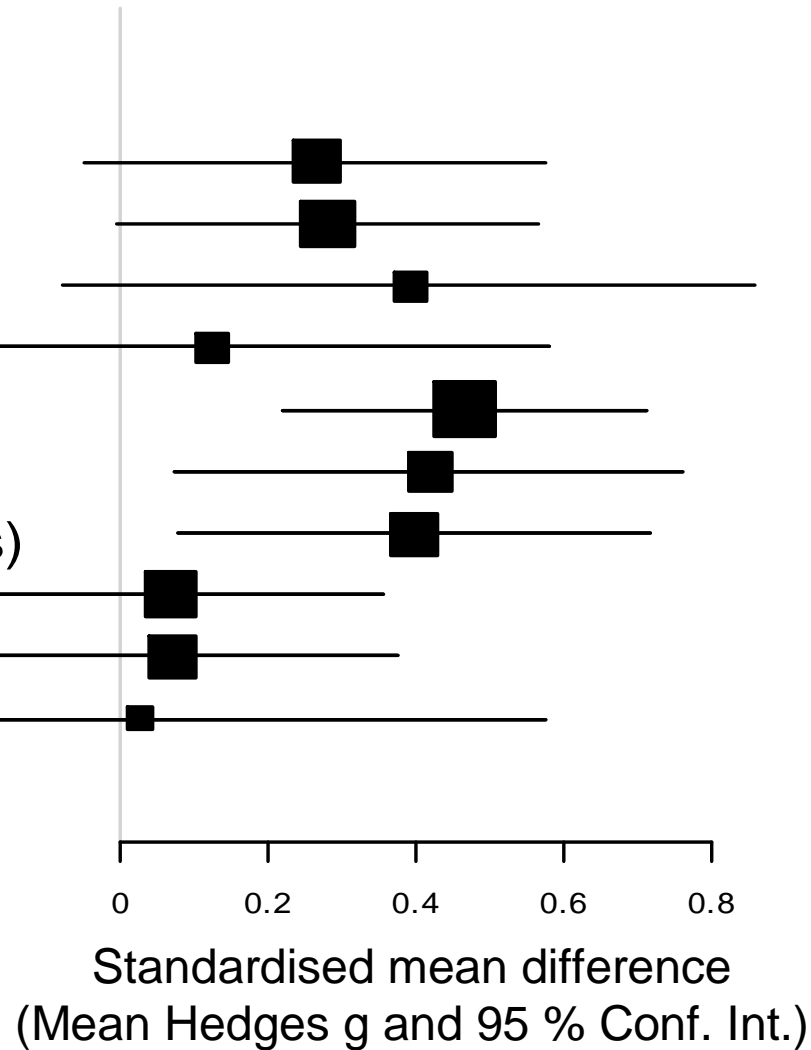
fatigue (4 studies)

sad/depressed (4 studies)

systolic bp (5 studies)

diastolic bp (4 studies)

cortisol (4 studies)



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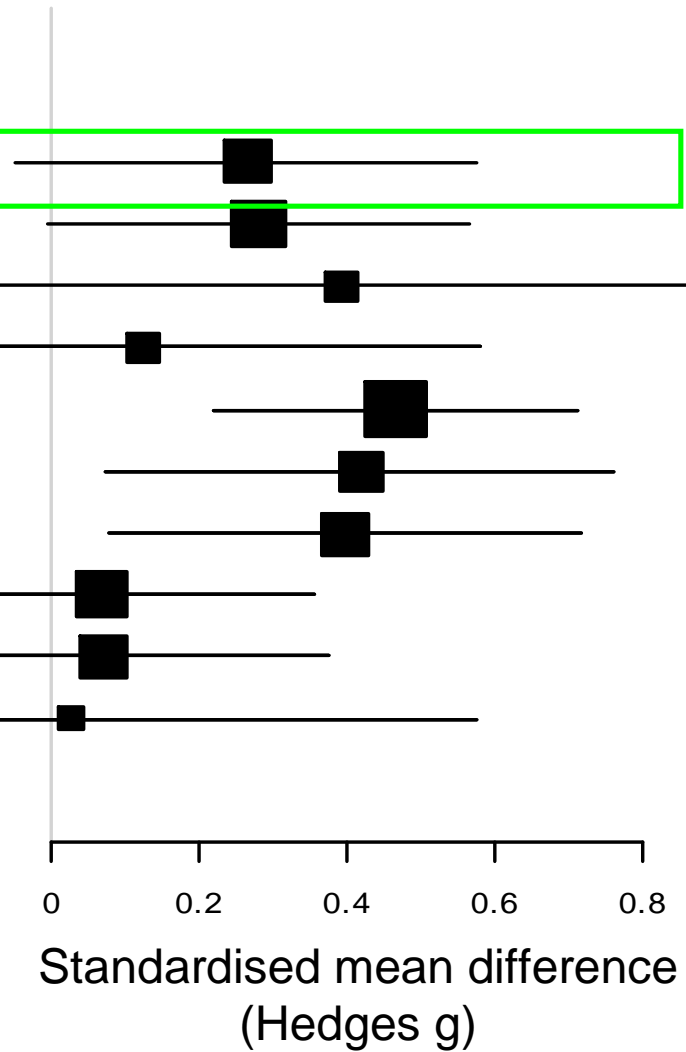
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diastolic bp (4 studies)

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Change in attention not statistically significant



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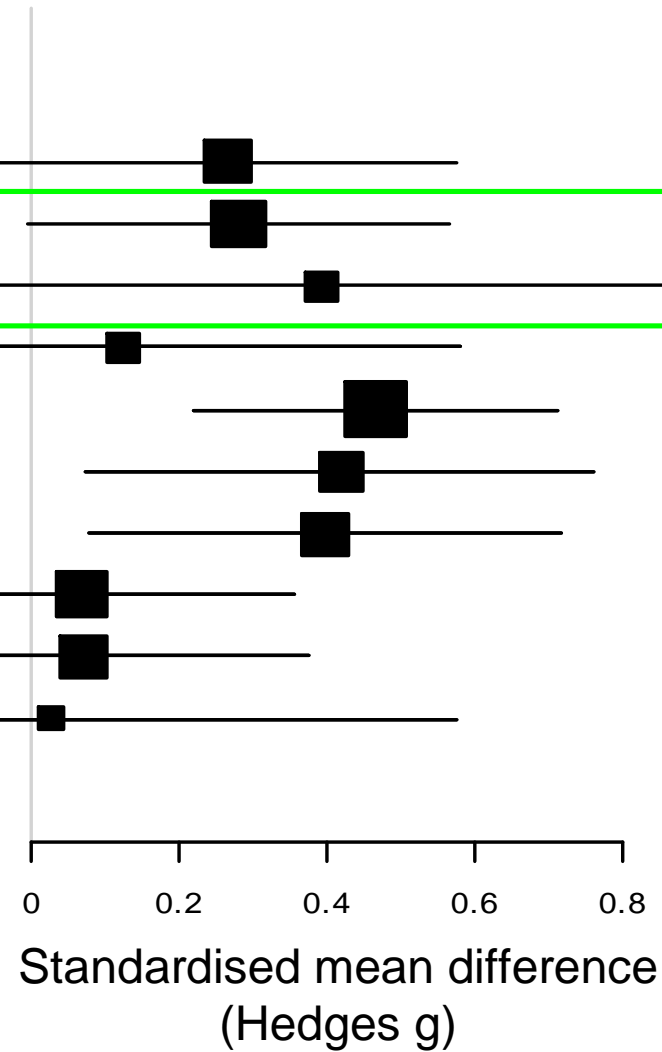
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Marginal significant increase in 'energy'
Variable effect on 'tranquillity'



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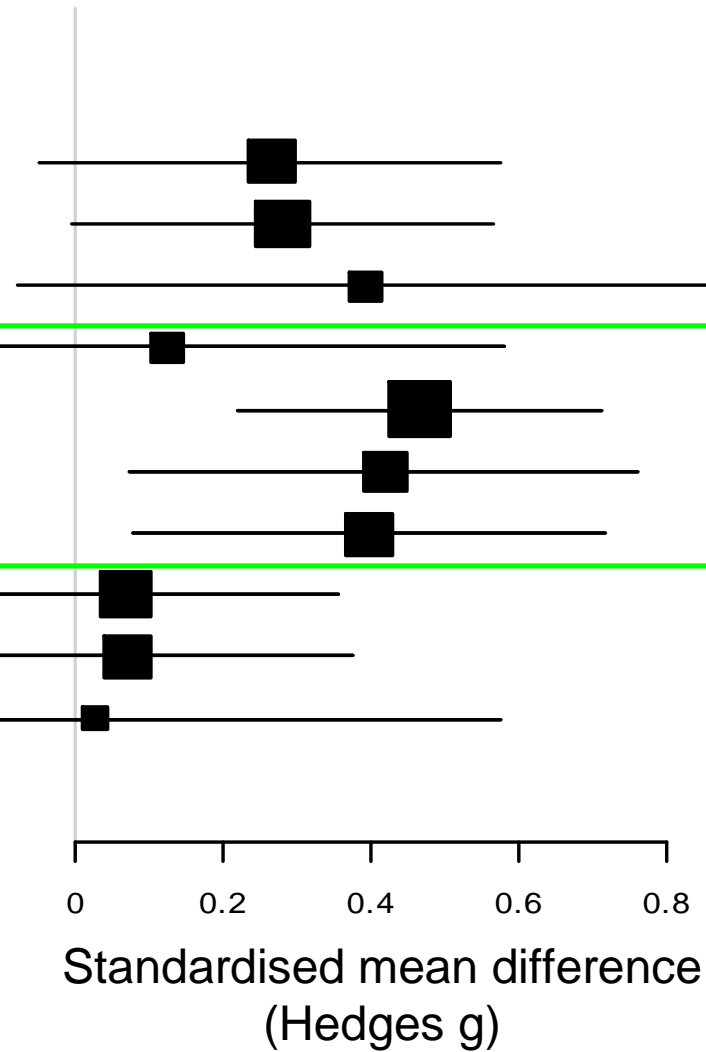
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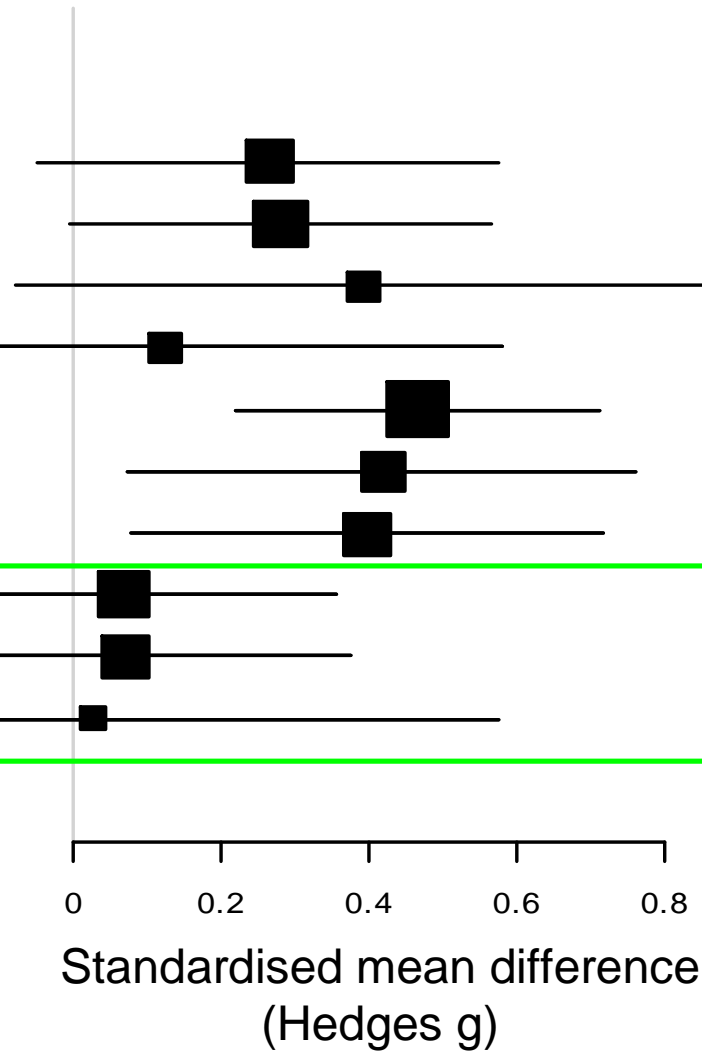
Improvements (i.e. reduction) in 'anger', 'fatigue' and 'depression'



STUDY FINDINGS

Outcome

- attention (4 studies)
- energy (5 studies)
- tranquility (7 studies)*
- anxiety (6 studies)*
- anger (7 studies)
- fatigue (4 studies)
- sad/depressed (4 studies)
- systolic bp (5 studies)
- diastolic bp (4 studies)
- cortisol (4 studies)



Variable effects on blood pressure and cortisol concentrations



EXPLORATION OF HETEROGENEITY

- There was evidence of significant heterogeneity in effects on “tranquillity” and “anxiety”
- Various factors can be hypothesized to influence the effect size
 - Does it depend on the type of participant?
 - Does it depend on context (e.g. after a stressful event/mental task)?
 - Does it depend on the type of natural environment?
- Because of the low number of studies available, these factors could not be explored.



LIMITATION TO THE STUDIES

- Studies were short-term – longer-term implications of repeated exposure?
- Measurements of emotions were self-reported – potential for bias
- Restricted to certain types of participants (university students/ active individuals) and natural environments (parks/green uni campuses) – unable to generalise to universal benefits



INTERPRETATION OF THE REVIEW

- Studies were variable and investigated a range of different questions – caution to interpretation of pooled results from meta-analysis
- Many studies did not meet the inclusion criteria of the review because they did not include a comparator environment
 - Our review addressed whether there was an 'added value' of an activity in a natural environment
 - Activities in natural and non-natural environments may both have positive health benefits (i.e. no added value) although this might be achieved in different ways



CONCLUSIONS

- Data suggestive that natural environments may have positive benefits for well-being.
- But data does not allow for generalized statements on universal benefits.
- Link between nature and health deserves further investigation testing specific hypotheses to understand the specific mechanism involved.



THANKS TO:

- Dave Stone (Natural England)
- All the project stakeholders
- CEBC colleagues

