



European Centre for
Environment & Human Health



Beyond Greenspace Research: Beaches, Biodiversity and Bats

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EUROPEAN UNION
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European Regional
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convergence
for economic
transformation



Natural environment and health

- Existing evidence indicates exposure to the natural environment may be a significant resource for human health and wellbeing
- Most consider natural areas as homogenous **'greenspace'**
- Evidence is mixed and sometimes contradictory
- **Crude definitions of 'greenspace' used?**
- What *is* **urban 'greenspace'**? What are the important facets for health and wellbeing?





Life Expectancy (Mitchell & Popham, 2008)

- Small area density of 'green space' (Generalised Land Use Database 2001)
- Compared to small area mortality rates

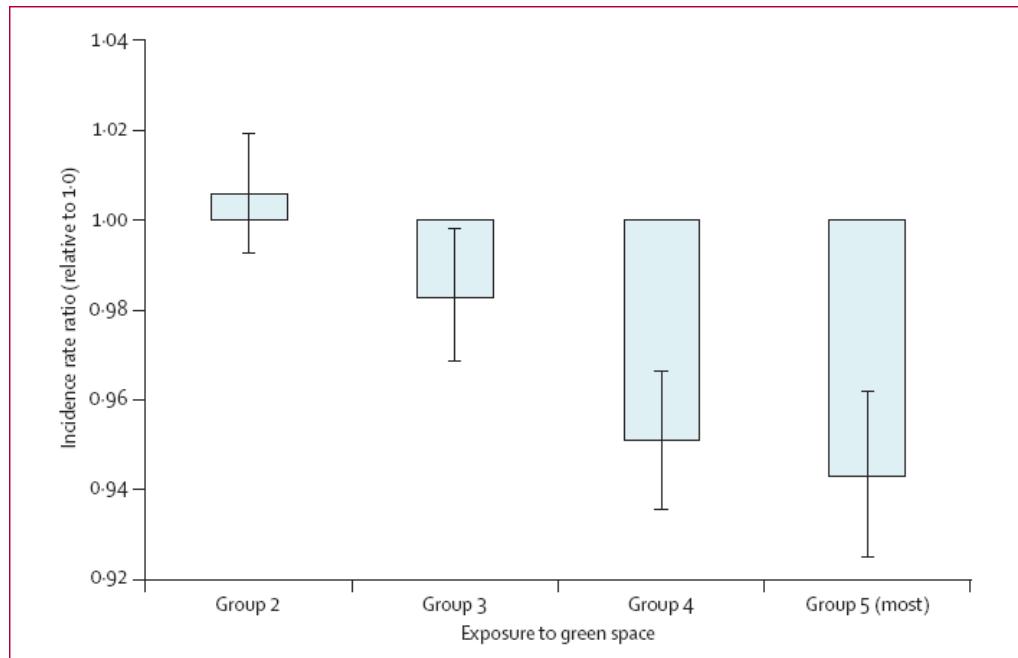


Figure 1: Incidence rate ratios for all-cause mortality in groups of exposure to green space, relative to group 1 (least exposure to green space)
Error bars indicate 95% CIs.

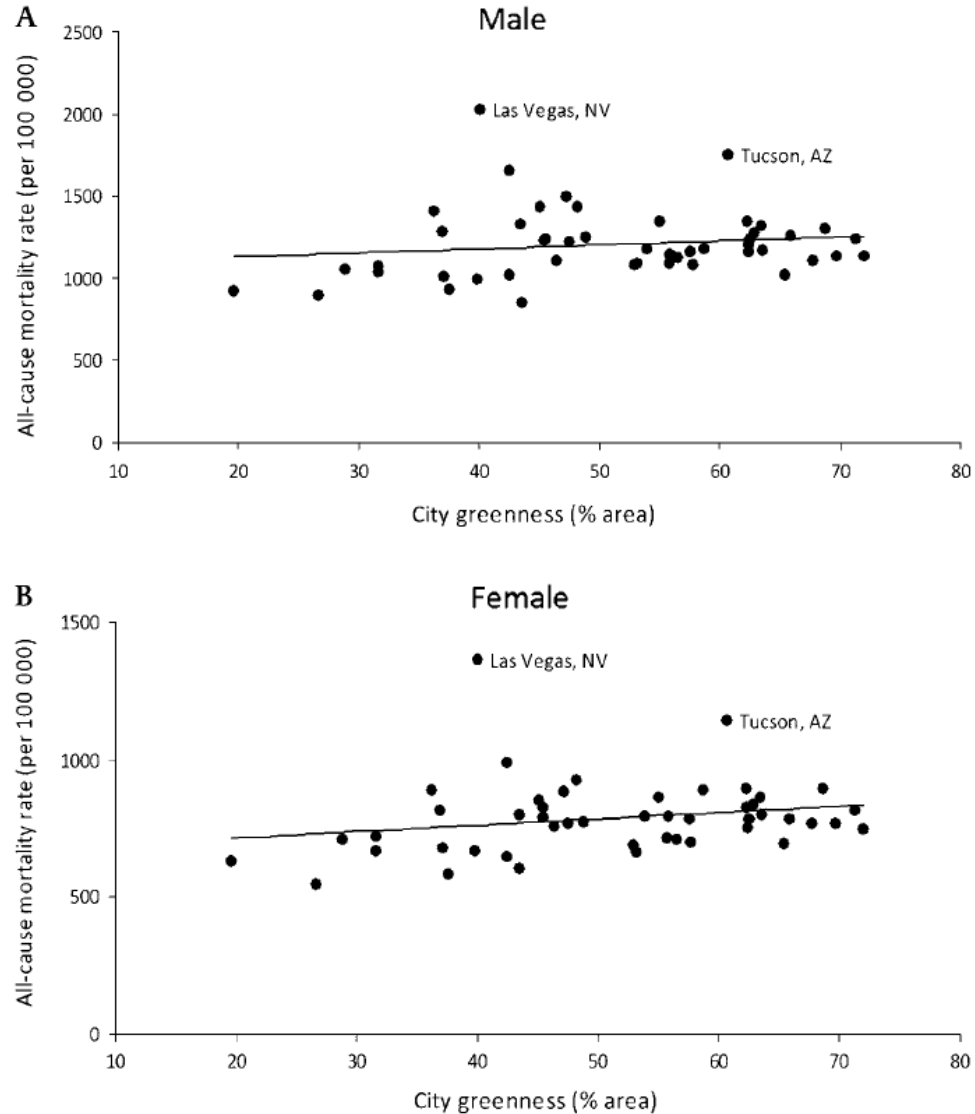
Higher green space density associated with lower all cause and cardiovascular mortality





Figure 1 Relationship between all-cause mortality (age-standardised rate) and city greenness for (A) males and (B) females. Unadjusted linear best-fit predictions have been superimposed. The two outlying cities have been labelled.

US cities: higher green space density associated with higher all cause mortality





What is greenspace?

- Generic term
- Gives no indication of type, quality or biological diversity of the green area
- Likely that health and wellbeing will vary according to these factors, and the relationships may vary geographically





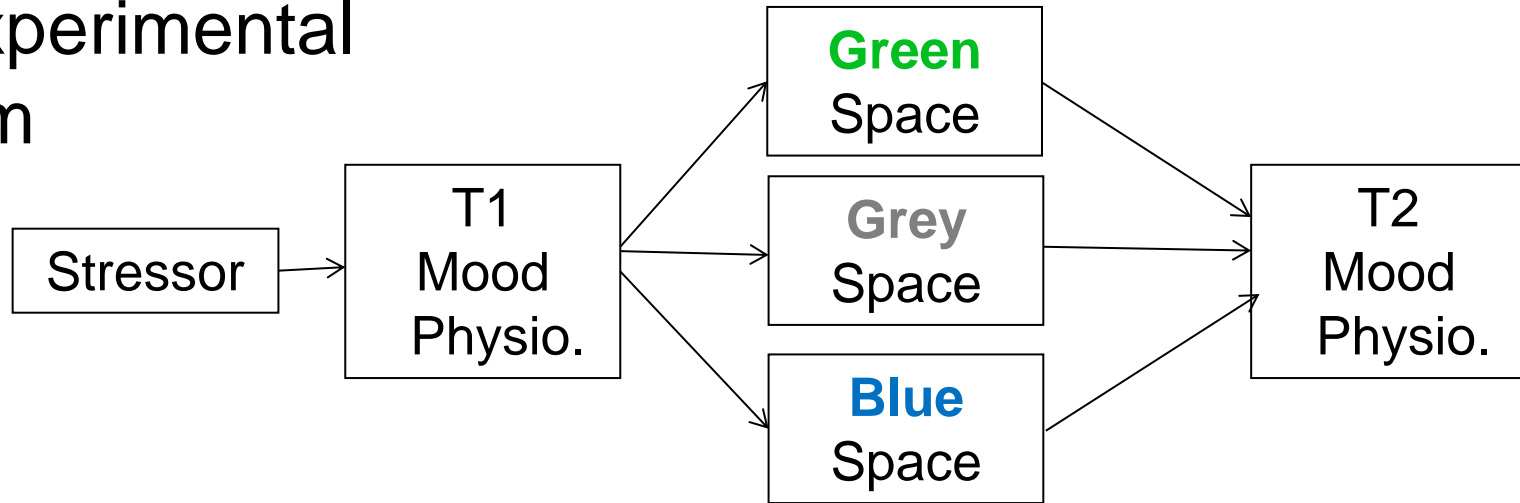
Current research examples

- Water - blue space and health?
 1. Lab studies
 2. Census data analysis – coastal living
- Biodiversity and health?
 3. Systematic review
 4. Indicators in rural areas





Basic Experimental Paradigm



Lab work:

(Films, Sounds, + During
Exercise)



Applied Settings:



Dental surgeries (+ VR)





Showed people 120 images: Built, Green, Blue



| Primary Prop. (≈2/3rds) | Aquatic | | | Green | | | Built | | | |
|--------------------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|------------|
| Secondary Prop. (≈1/3rd) | Aquatic | Green | Built | Aquatic | Green | Built | Aquatic | Green | Built | Total |
| Scene only | 8 | 4 | 4 | 4 | 8 | 4 | 4 | 4 | 8 | 48 |
| + Animal/s | 4 | 2 | 2 | 2 | 4 | 2 | 2 | 2 | 4 | 24 |
| + Person/s | 4 | 2 | 2 | 2 | 4 | 2 | 2 | 2 | 4 | 24 |
| + Object/s | 4 | 2 | 2 | 2 | 4 | 2 | 2 | 2 | 4 | 24 |
| Total | 20 | 10 | 10 | 10 | 20 | 10 | 10 | 10 | 20 | 120 |

5 items from the Perceived Restorativeness Scale, e.g. *“That is a place which is away from everyday demands and where I would be able to relax and think about what interests me”*



3/3rds Green



2/3rds Green



2/3rds Blue

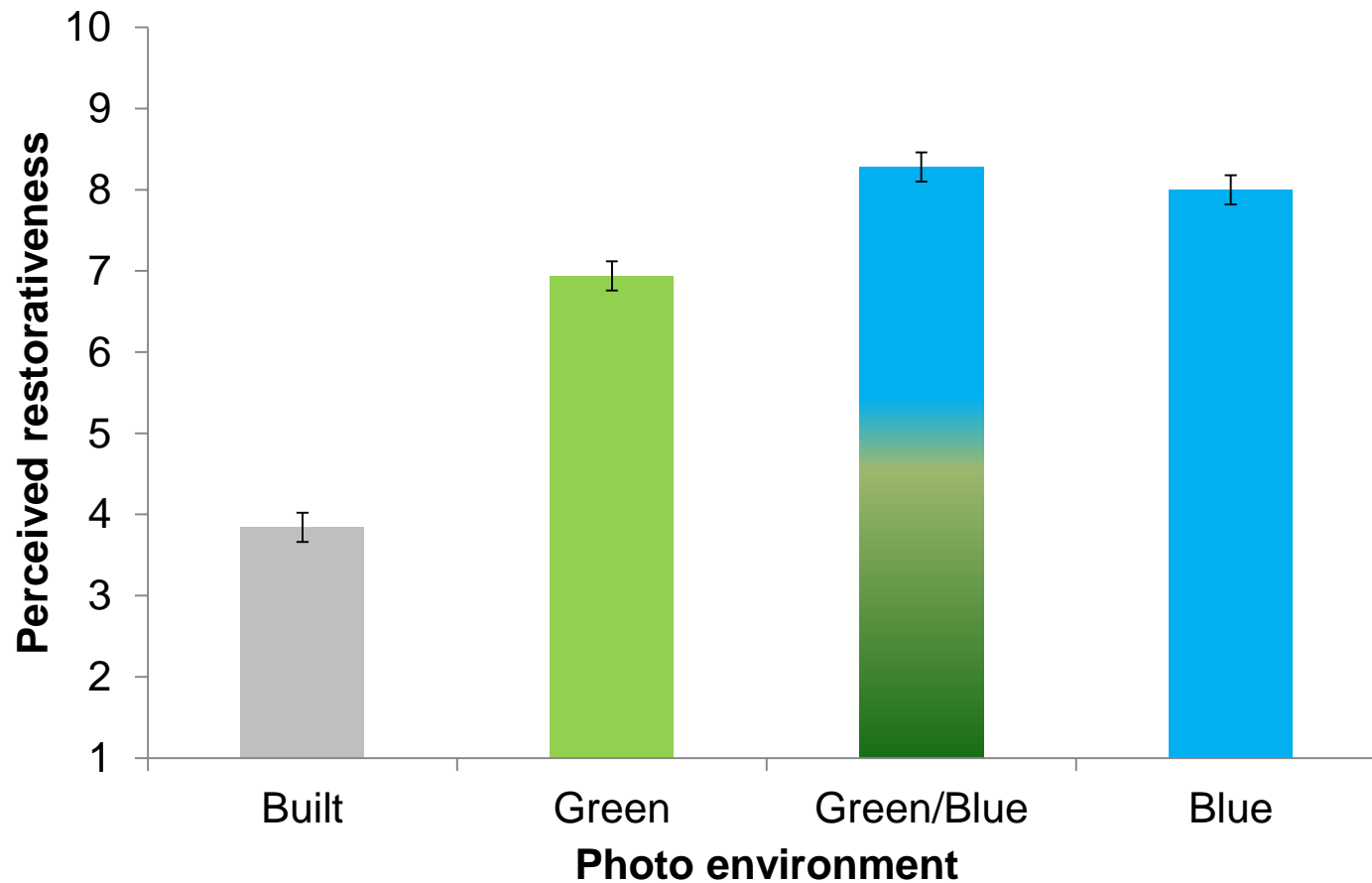


3/3rds Blue



Perceived restorativeness

How good is this place for helping you feel better and think clearer?



Means with
standard errors

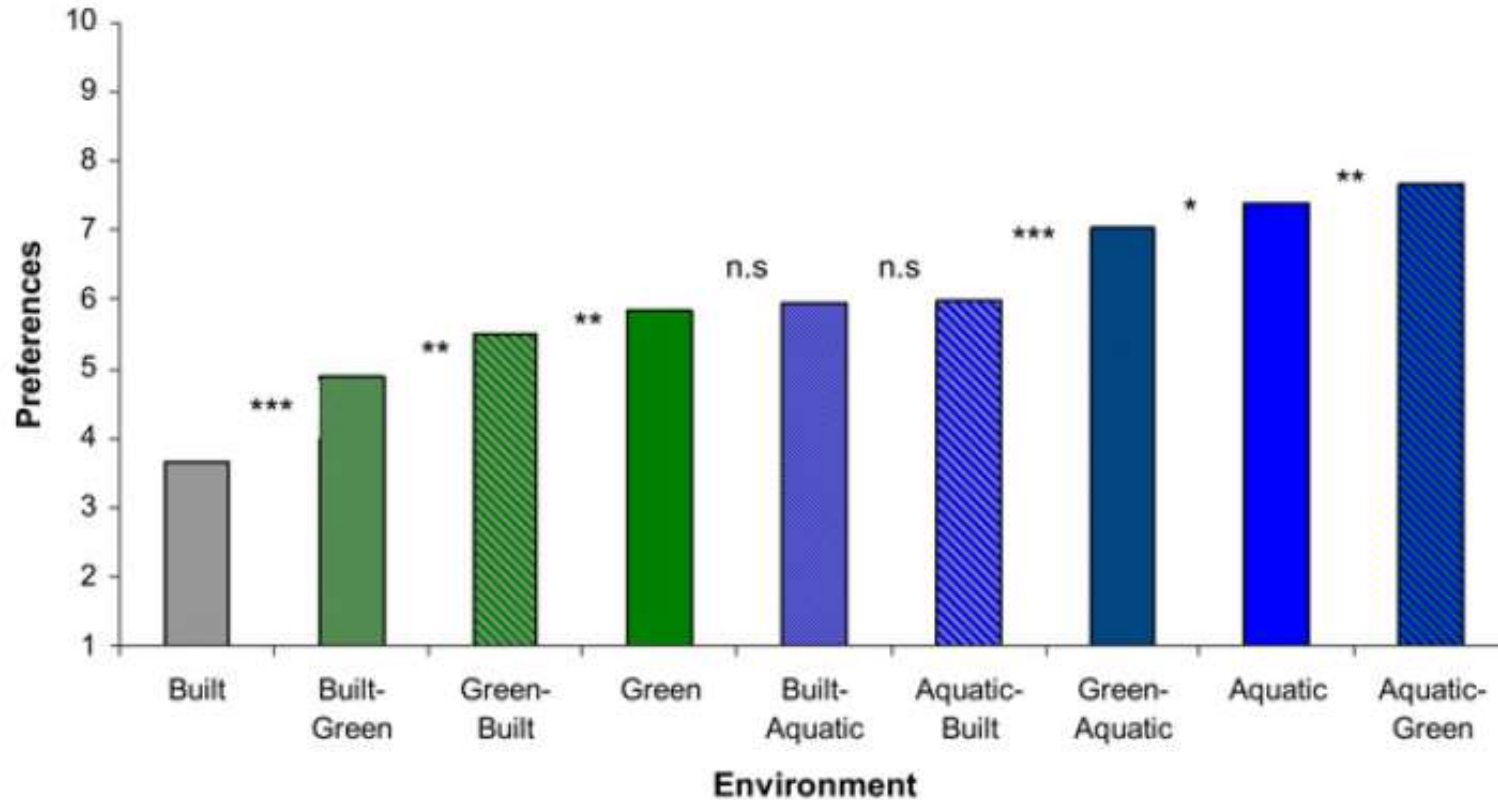



Fig. 2. Environments ranked from least to most Preferred. Note: The significance of differences between adjacent environments (using planned repeated contrasts) is shown between them: *** $p < .001$, ** $p < .01$, * $p < .05$, n.s. not significant.

White, M.P., Smith, A., Humphries, K., Pahl, S., Snelling, D. & Depledge, M. (2010) Blue space: The importance of water for preference, affect and restorativeness ratings of natural and built scenes. *Journal of Environmental Psychology*.



Census 2001: Health at the coast



H1

29 April
count me in
Census2001

England Household Form

11 Over the last twelve months
would you say your health has
on the whole been:

- Good?
- Fairly good?
- Not good?

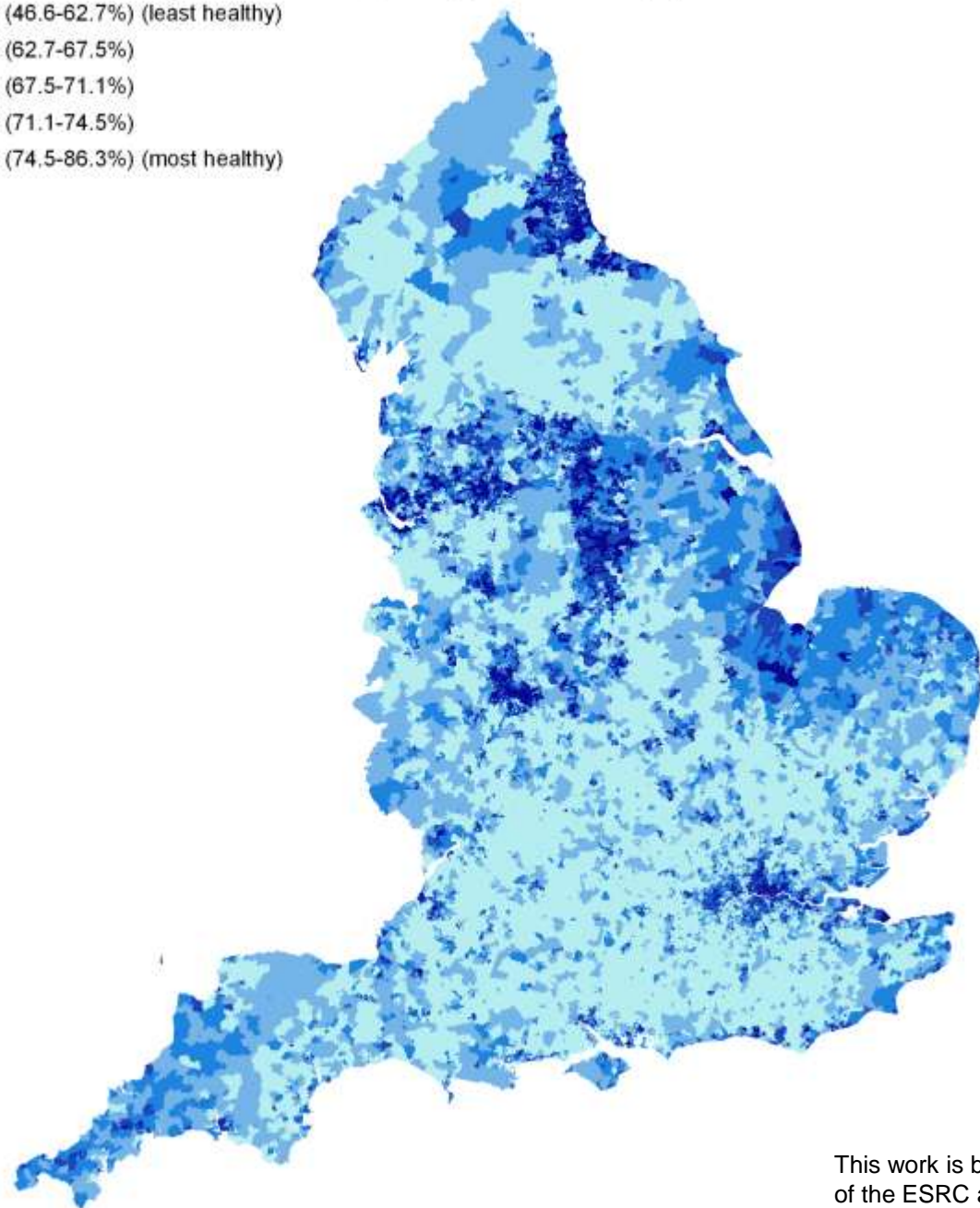
Mapped for 32,000 small areas...



Lower layer super output areas

Quintiles of directly standardised 'good' general health (%)

- 1 (46.6-62.7%) (least healthy)
- 2 (62.7-67.5%)
- 3 (67.5-71.1%)
- 4 (71.1-74.5%)
- 5 (74.5-86.3%) (most healthy)

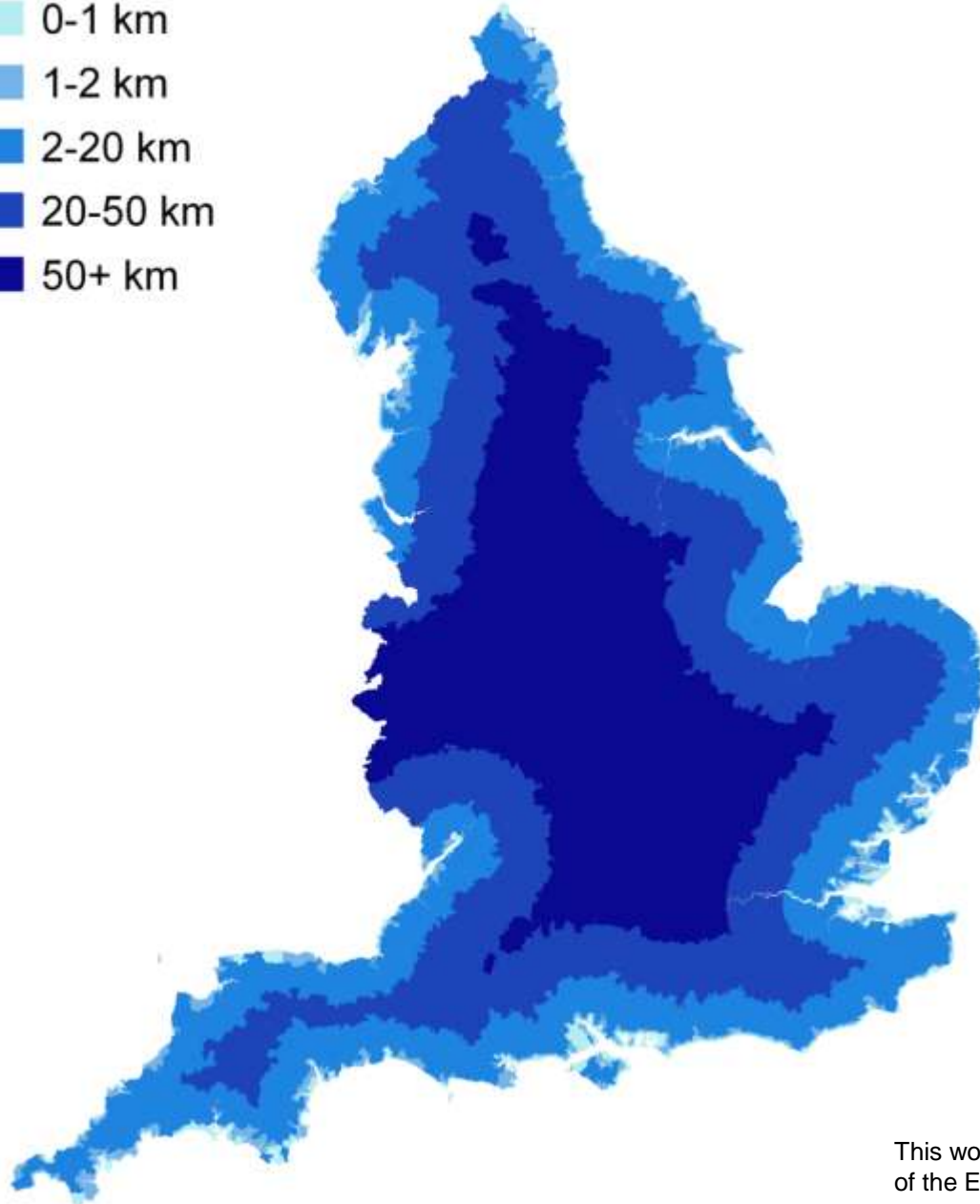


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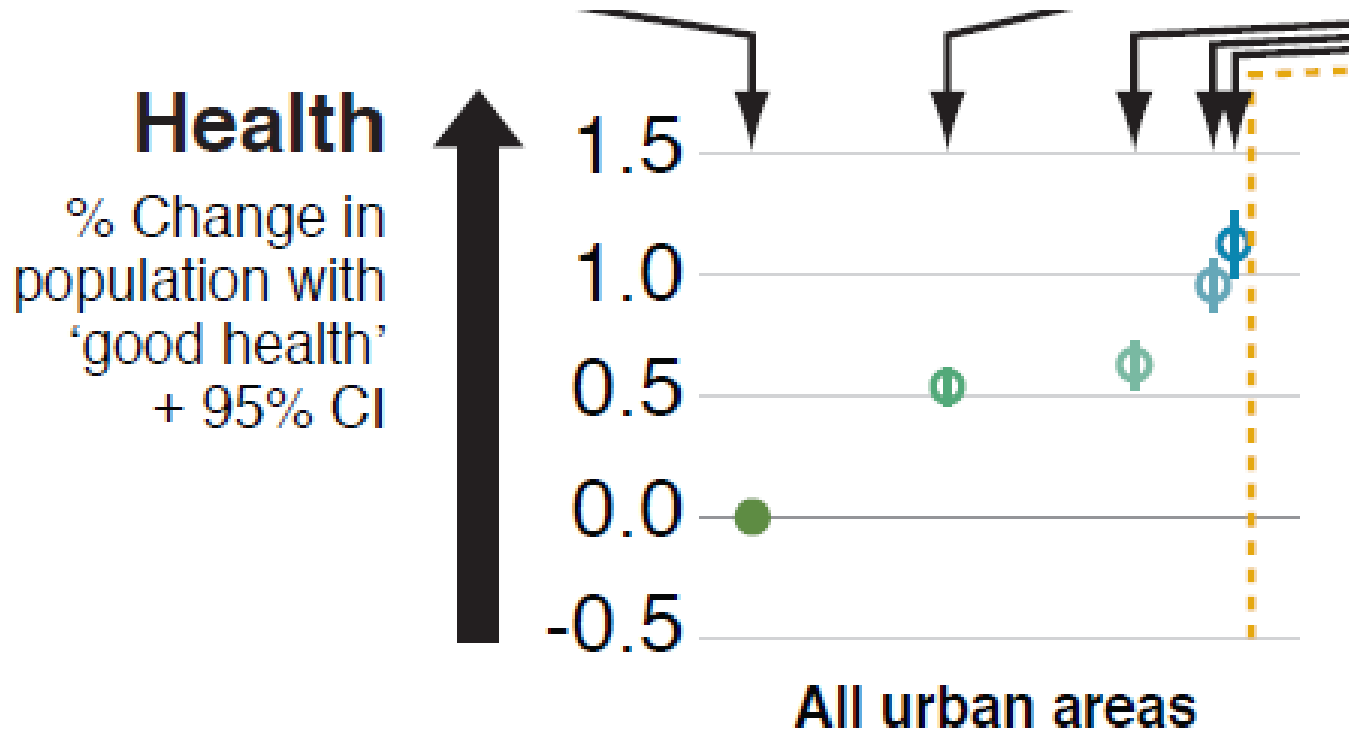
Lower layer super output areas

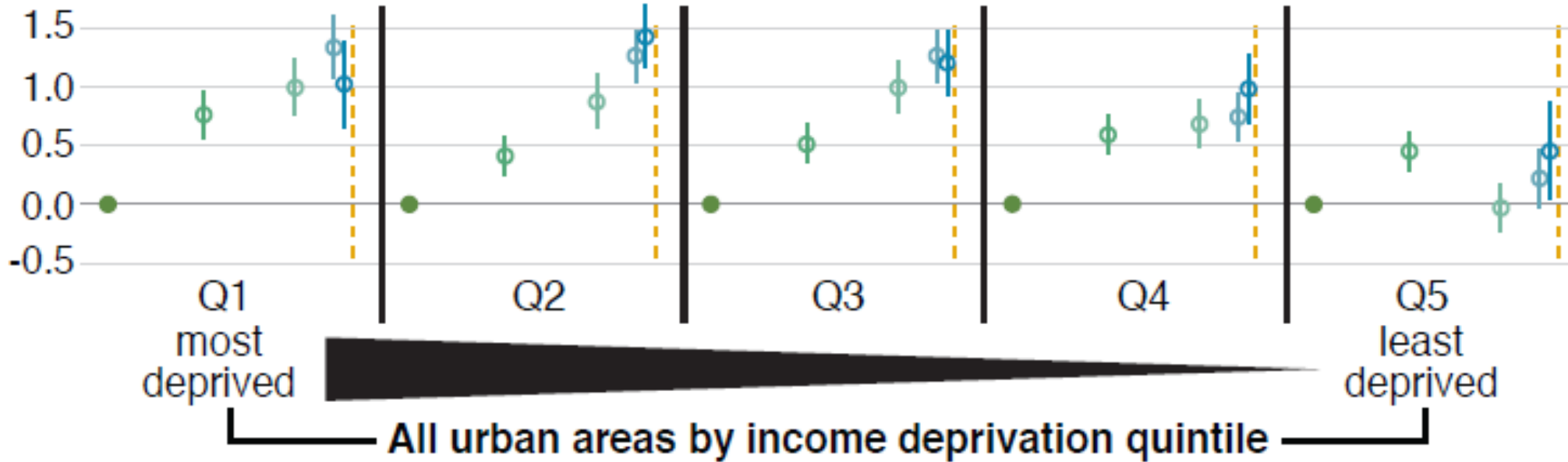
Distance to coast (from pop weighted centroid)

- 0-1 km
- 1-2 km
- 2-20 km
- 20-50 km
- 50+ km



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OLS regression coefficients; all models adjust for age, sex, 5 deprivation domains, inland water and greenspace



3. Biodiversity & health: systematic review

Research Question: *"What is known from existing literature about whether more biodiverse 'natural' environments can have greater salutogenic effects than less biodiverse 'natural' environments?"*



We included studies which specifically considered:

- an objectively or subjectively assessed measure of biodiversity or species richness

AND (one or more)

- primary health related outcomes including any self- or objective measures of physical or mental health outcomes whether specific or general, or psychological wellbeing; and/or
- secondary health related outcomes including self- or objective measures of improved health behaviours (e.g. physical activity) or processes shown to promote good physical and mental health (e.g. psychological restoration)



Findings

- The systematic review is currently being finalised and prepared for peer review





Beyond Greenspace Project

- A preliminary analysis using data for rural areas of England is under way
- Findings are being prepared for peer review





Summary

- **'Greenspace'**-health and wellbeing relationships are complex
 - and by no means **'proven'**
- Various factors could be considered in design and planning of public natural spaces
 - urban biodiversity
 - natural water





Next steps: key approaches

- Analysis of longitudinal data – follow people over time → cause-effect
- Use GPS dataloggers etc. to understand exactly where people choose to spend time outdoors, physical activity etc.
- Qualitative research – in-depth understandings of how and why people use different spaces for health and wellbeing
- Capitalise on natural experiments to generate evidence (see MRC guidance)
- Public health interventions framework





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