



University  
of Glasgow | Institute of Health  
& Wellbeing



# More green, better health?

Prof Rich Mitchell



What am I going to say?

Public health context

How does green space affect health?

What were my research questions?

What kinds of study did I do?

What did we find?



All the work I am going to show you relies on data sets that other people collect and curate. Thanks to all at GROS, ONS, CRESH, the Scottish Health Survey team and the Scottish Social Attitudes Survey team. Many thanks too, to RESAS, our funders.

# APPLAUSE



We are interested in protecting and improving population health: thousands to millions of people



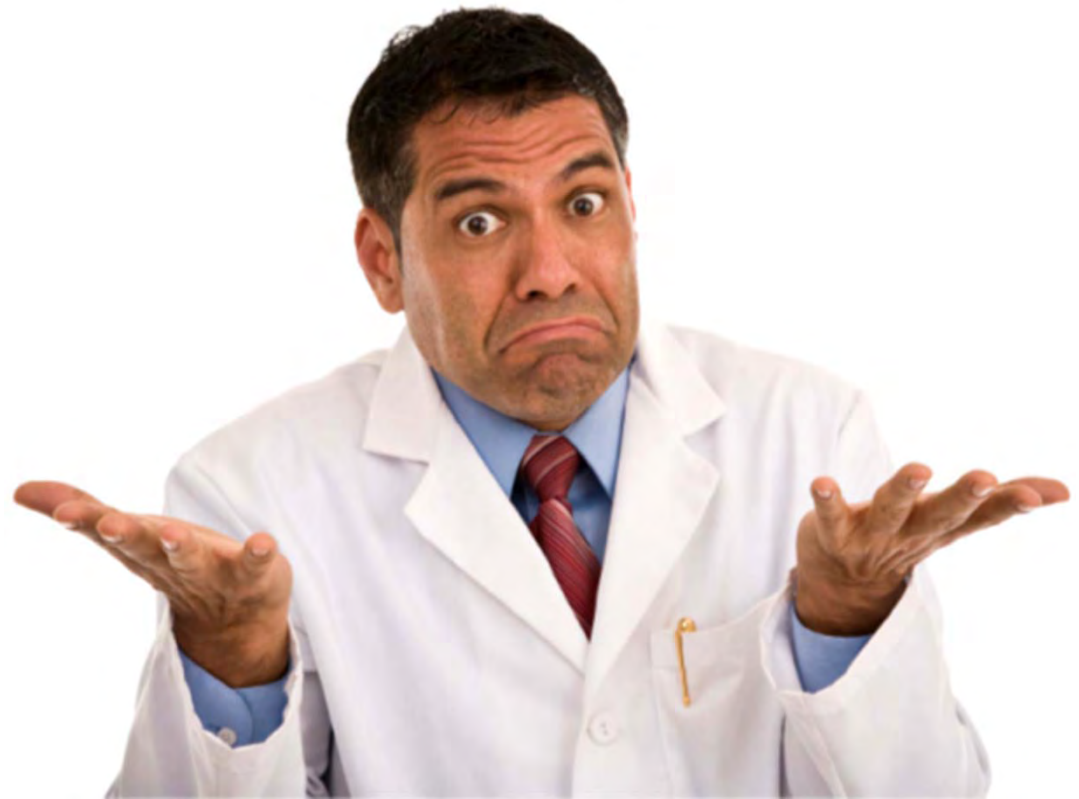


Although modern medicine has greatly reduced mortality rates, we still suffer from chronic diseases, are generally miserable, and lack wellbeing.

27% of the EU adult population experienced at least one mental disorder in the past year; an estimated 83 million people.



Clinical medicine struggles to fix problems of this nature and at this scale.







And so, a change in thinking is needed. How can our environment help us to stay healthy and well?

Good Places, Better Health.





Physical activity

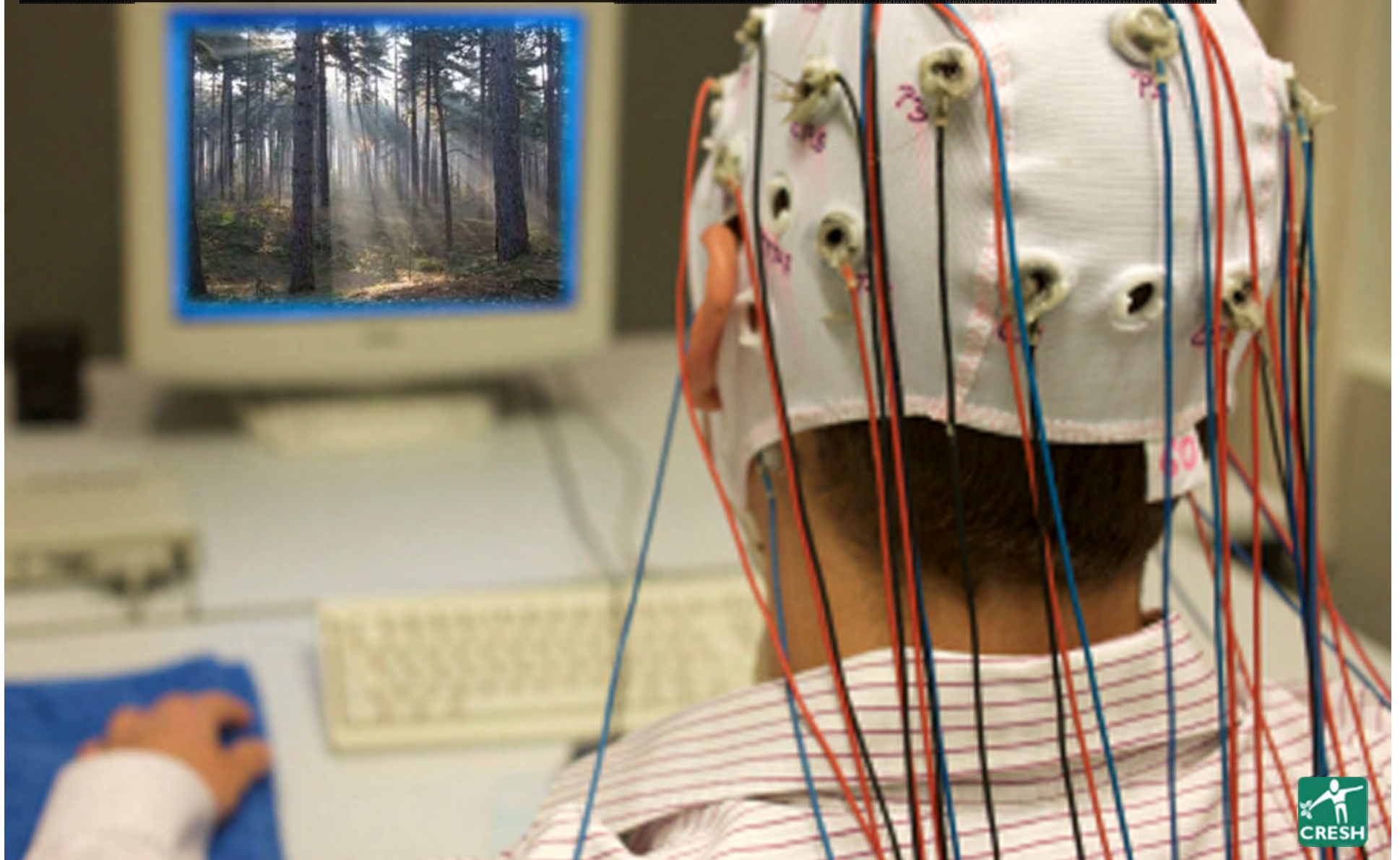
Social contact

Restoration

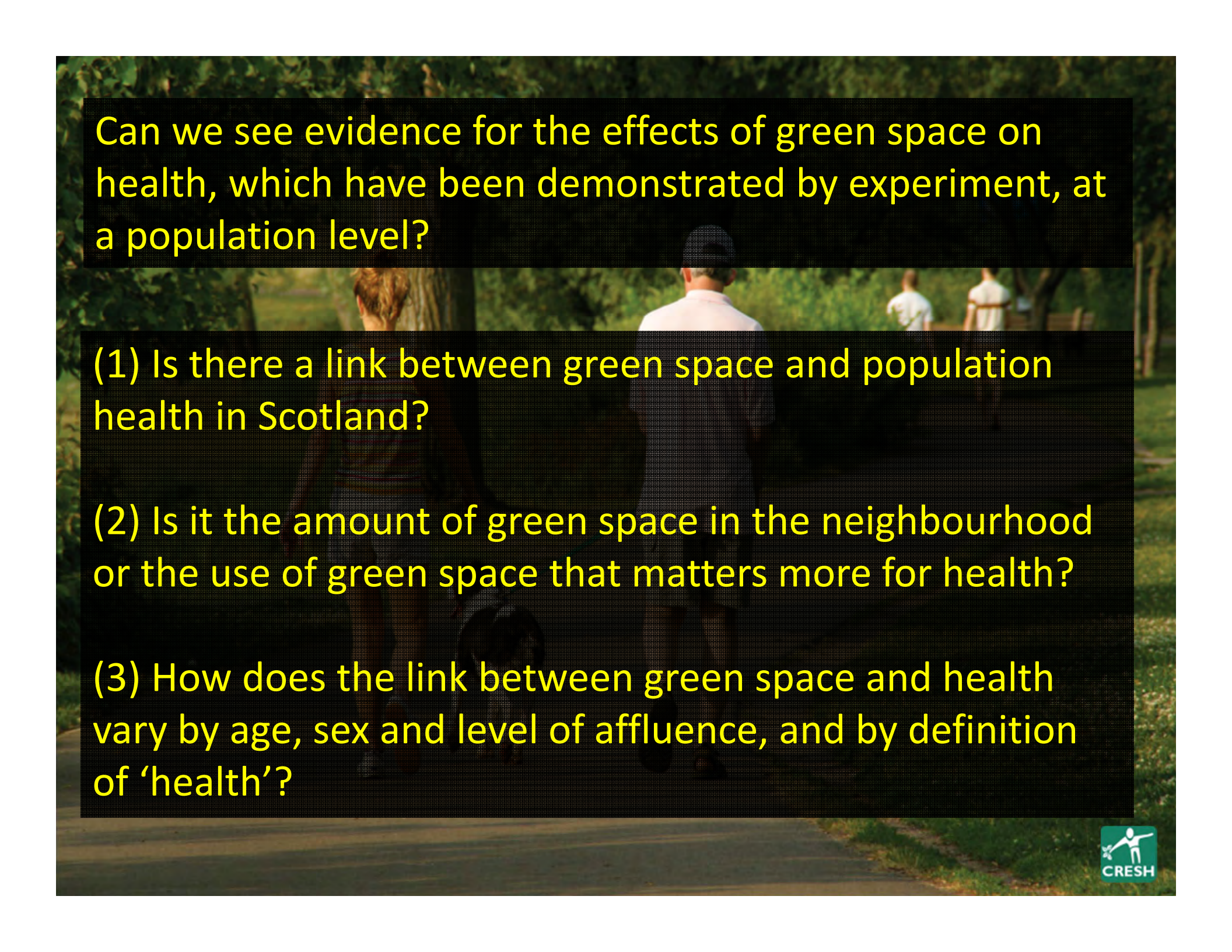




The evidence for a restorative effect comes primarily from experiments.





A background image showing a group of people walking away from the camera on a paved path in a park. The path is lined with lush green trees and foliage. In the foreground, a man in a light-colored shirt and dark trousers is walking, followed by a woman in a dark dress. Further ahead, other people are visible, including a man in a white shirt and a woman in a light-colored top. The scene is bright and sunny, suggesting a pleasant day in a green space.

Can we see evidence for the effects of green space on health, which have been demonstrated by experiment, at a population level?

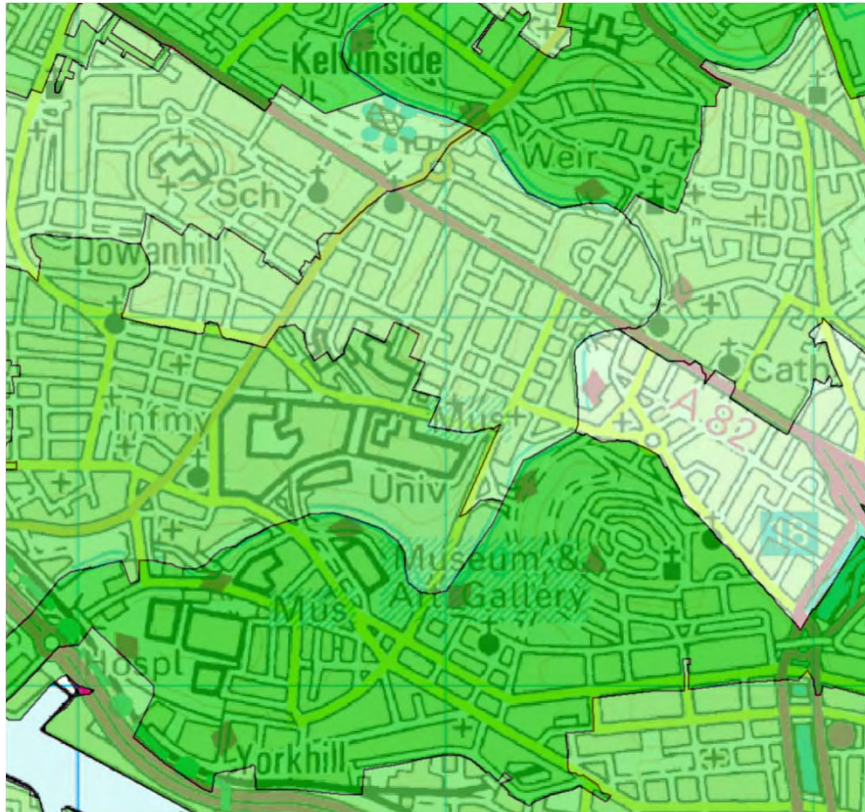
(1) Is there a link between green space and population health in Scotland?

(2) Is it the amount of green space in the neighbourhood or the use of green space that matters more for health?

(3) How does the link between green space and health vary by age, sex and level of affluence, and by definition of 'health'?



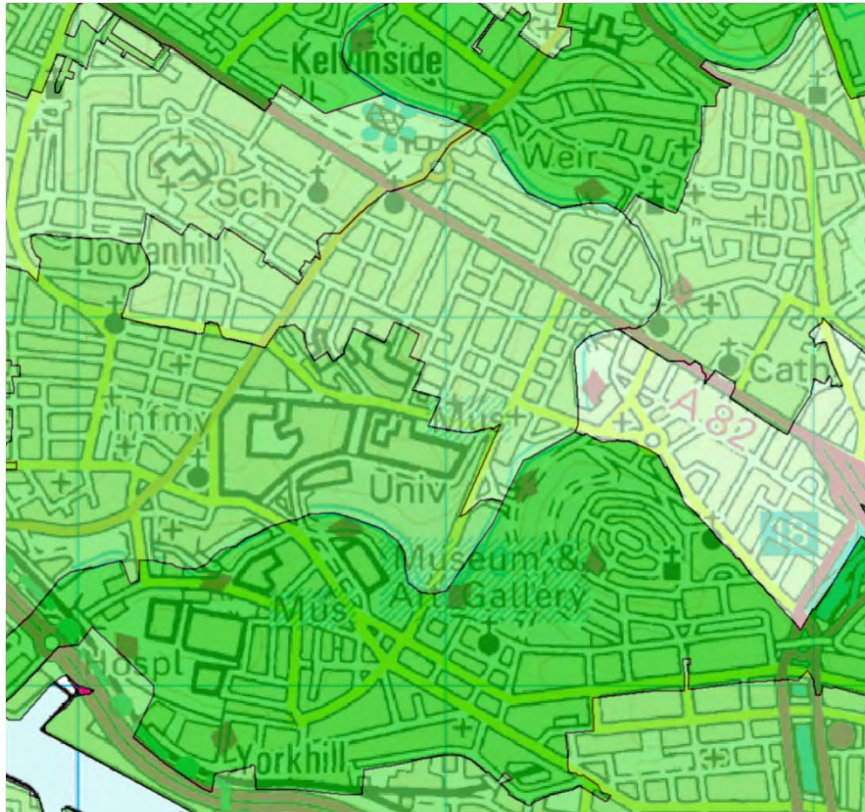
## How do we do this?



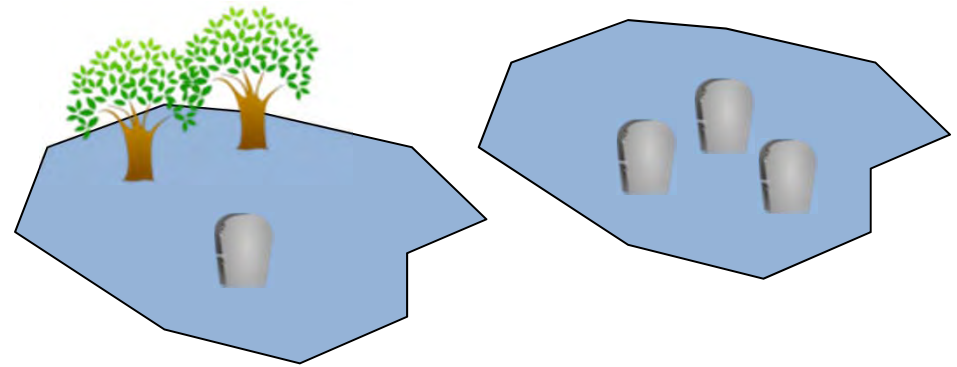
Estimates of the % land area in  
a neighbourhood that is green  
space [www.cresh.org.uk](http://www.cresh.org.uk)



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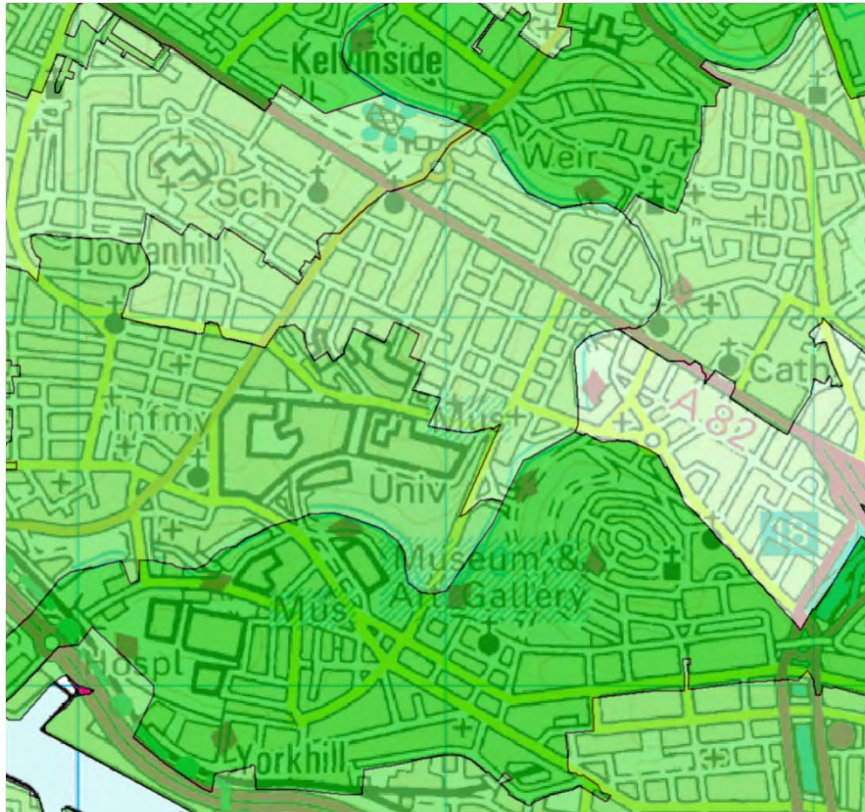


(1) Relate the health of everyone in  
a neighbourhood to how much  
green space there is (comparing  
neighbourhoods)

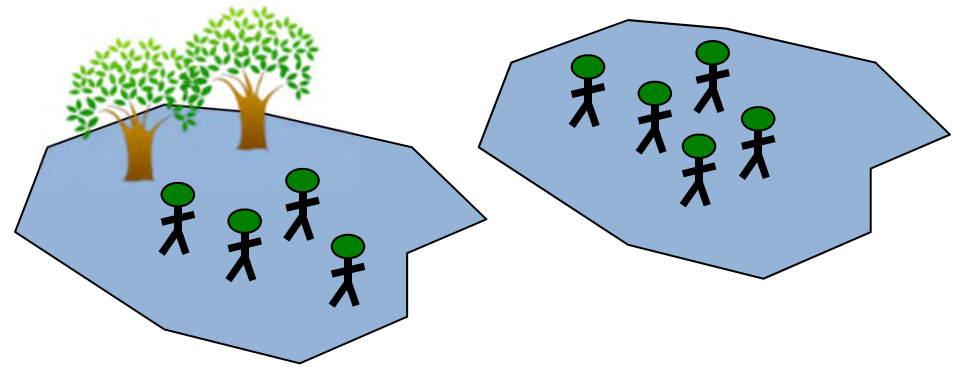
Mortality data from GROS & ONS  
(2001-2005)



## How do we do this?



Estimates of the % land area in  
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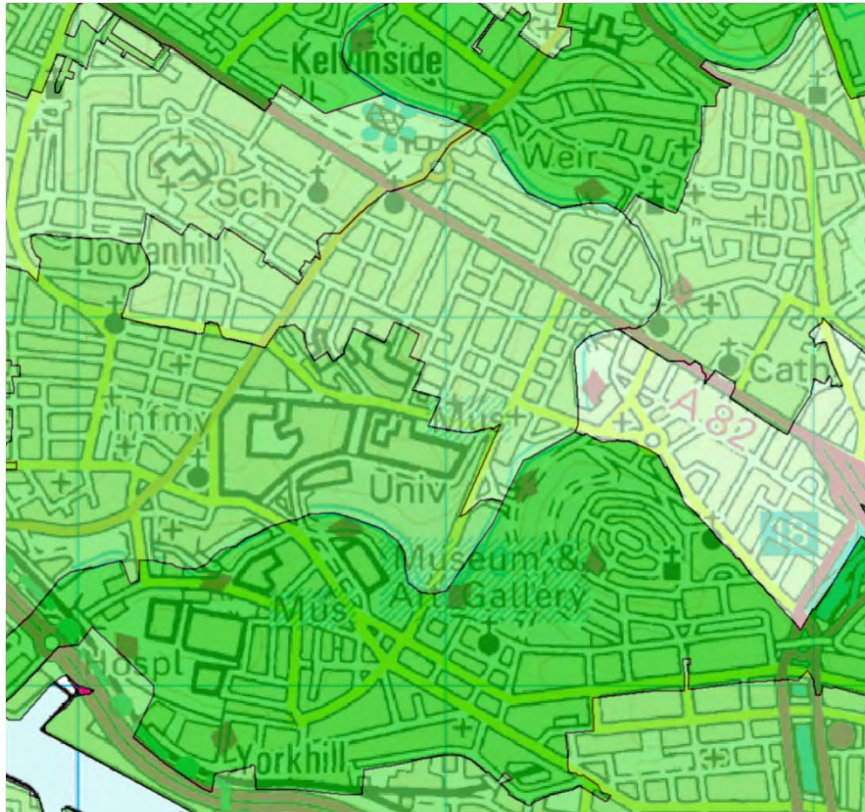


(2) Relate the health of individuals to  
how much green space they have in  
their neighbourhood &/or whether  
they visit green spaces (comparing  
individuals in different  
neighbourhoods)

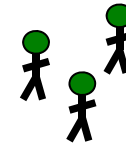
Scottish Health Survey 2008



## How do we do this?



Estimates of the % land area in  
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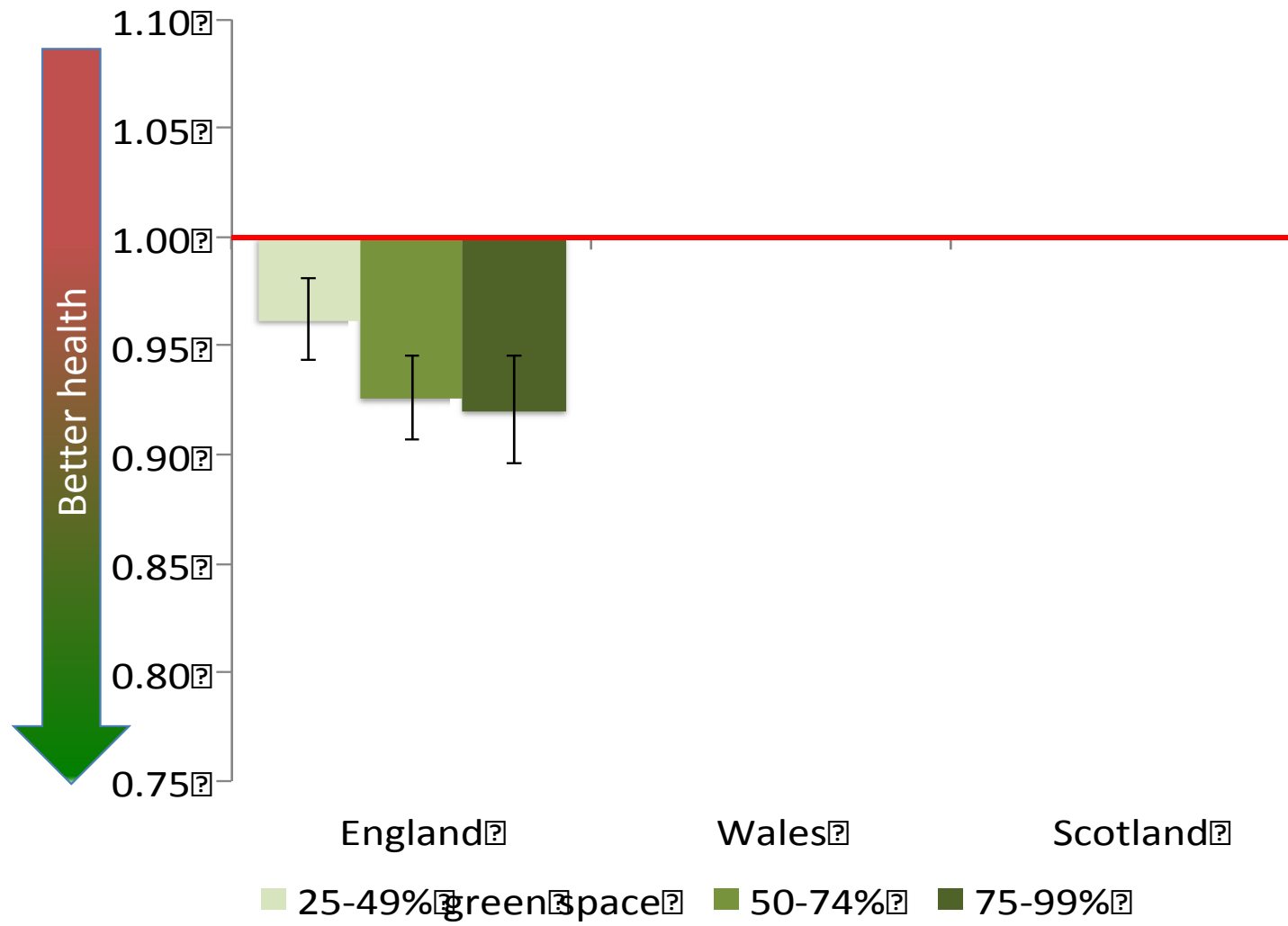


(3) Relate the health of individuals  
to whether they visit green spaces  
or not and what they do there  
(comparing individuals)

Scottish Health Survey 2008,  
Scottish Social Attitudes Survey  
2009

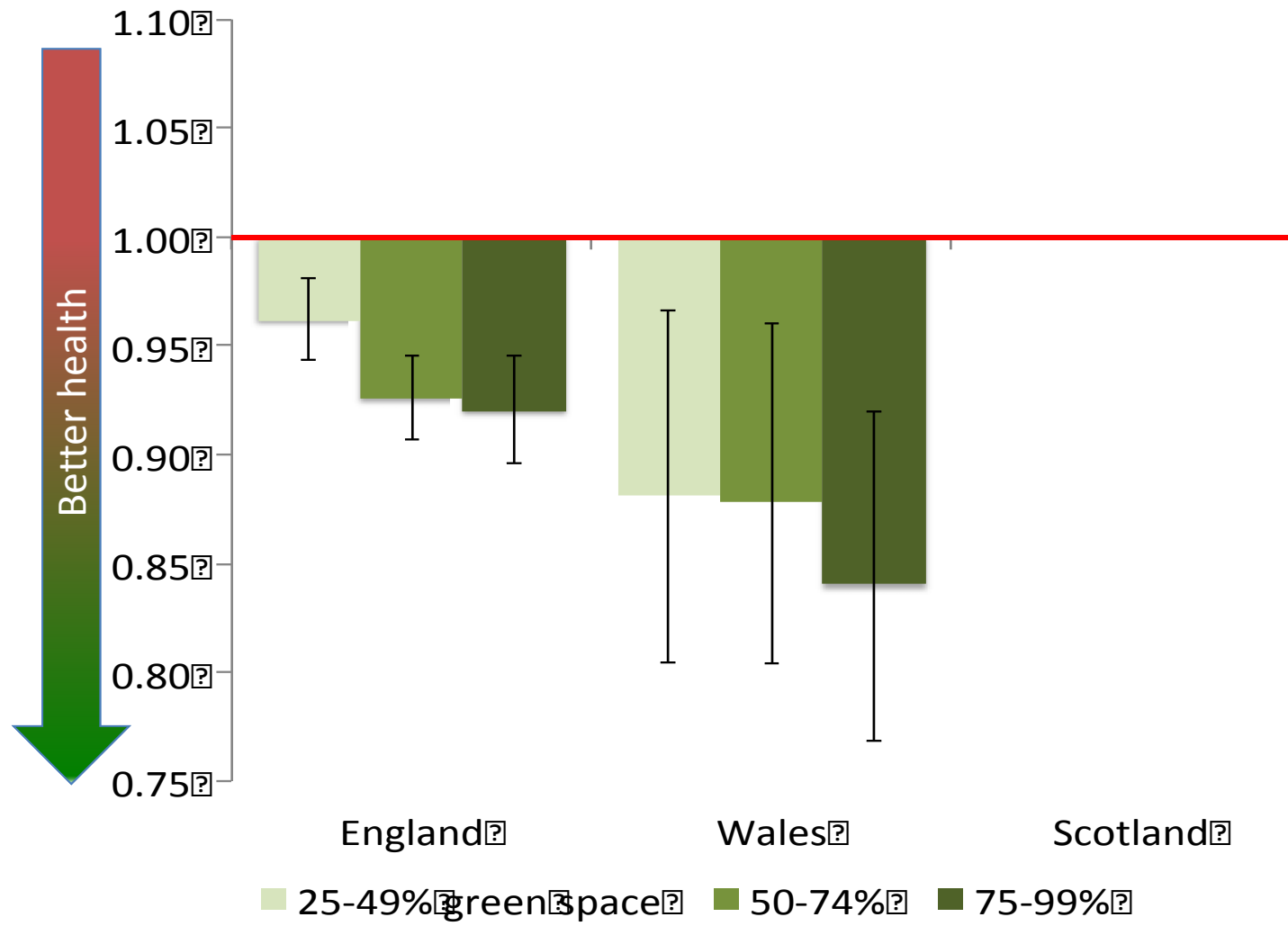


We already knew that greener urban areas in England have lower death rates.



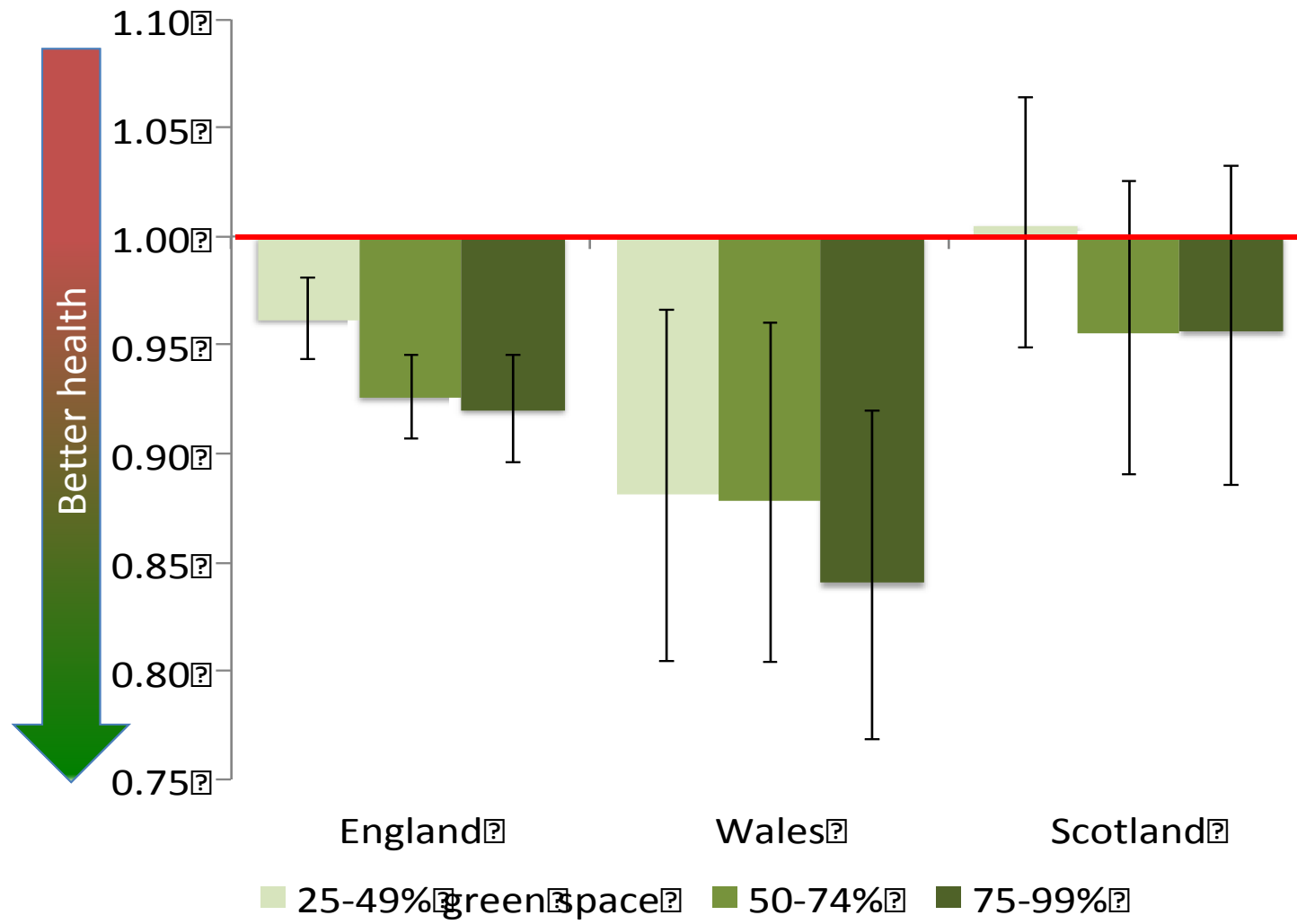


## We added analysis of Wales.





and Scotland! Greener urban neighbourhoods do not have lower mortality rates in Scotland.





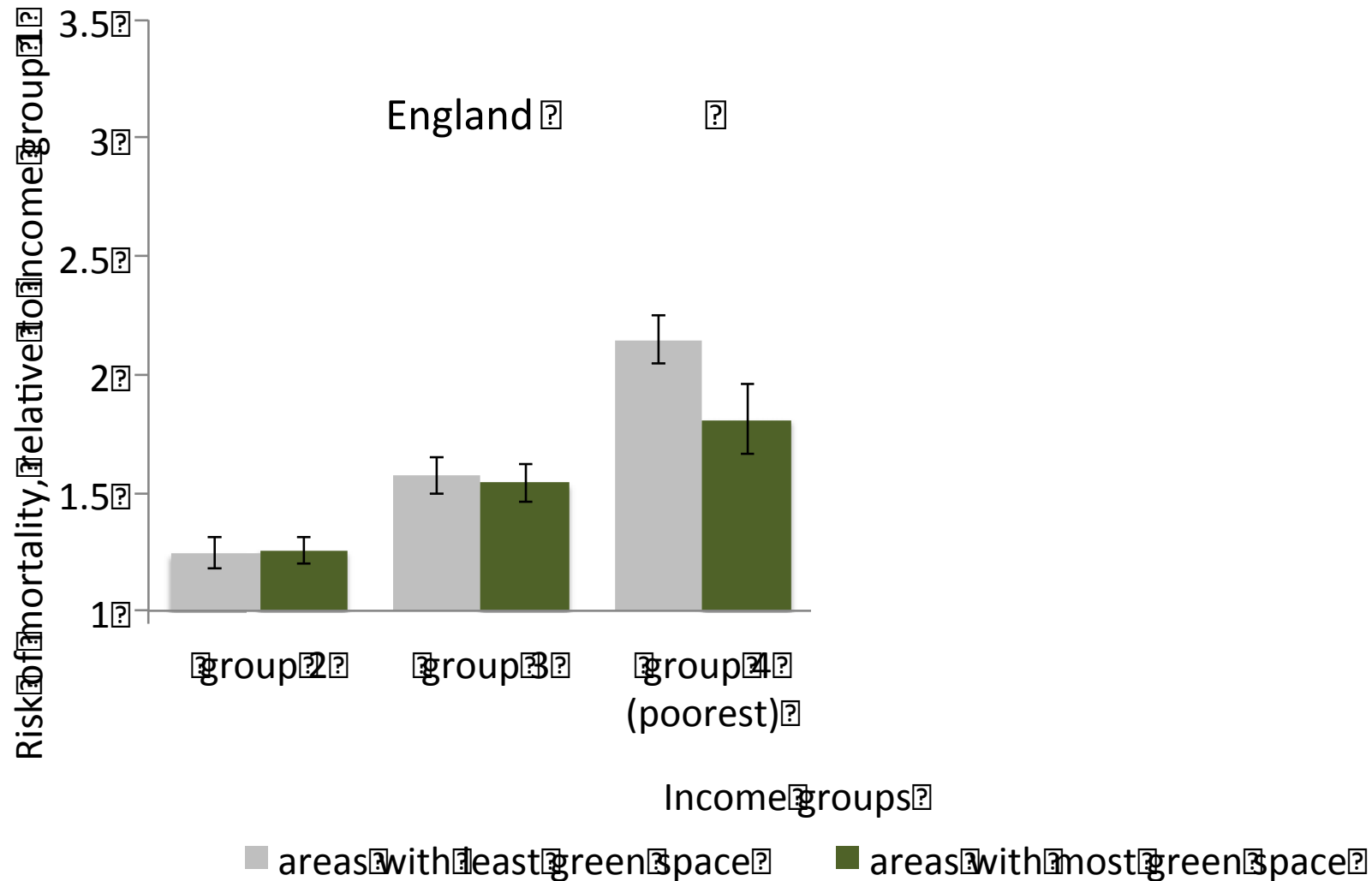
These relationships were also explored for men and women, for older, working and younger age people, for more and less urban areas, for richer and poorer groups, for deaths from cardiovascular and respiratory disease and for different definitions of green space and neighbourhood.

Among the most deprived working-age men, those resident in the greenest urban areas were about 16% less likely to die than those resident in the least green urban areas.

No relationships with women's risk of death.

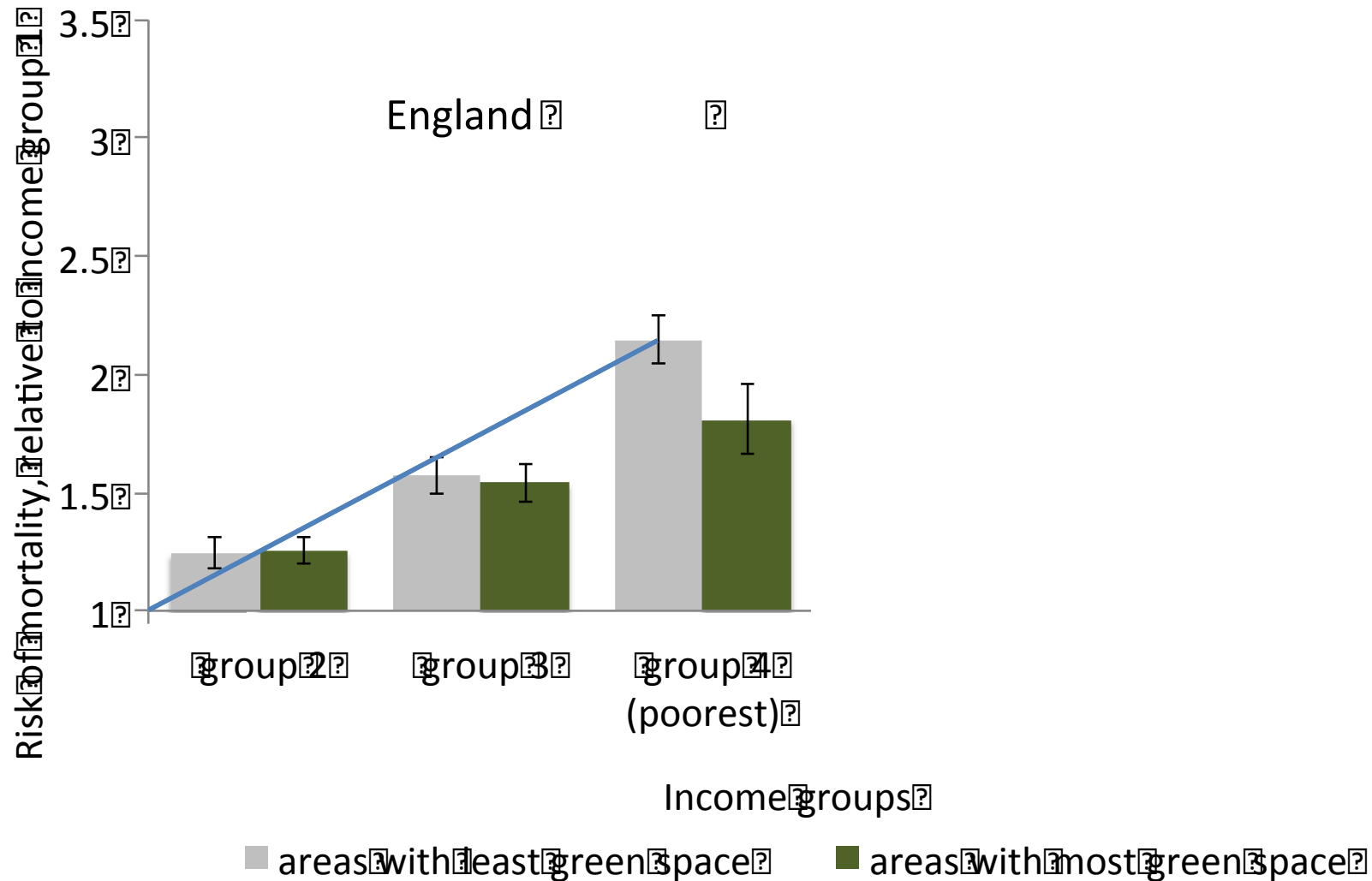


In England, income-related health inequalities are smaller in greener neighbourhoods.



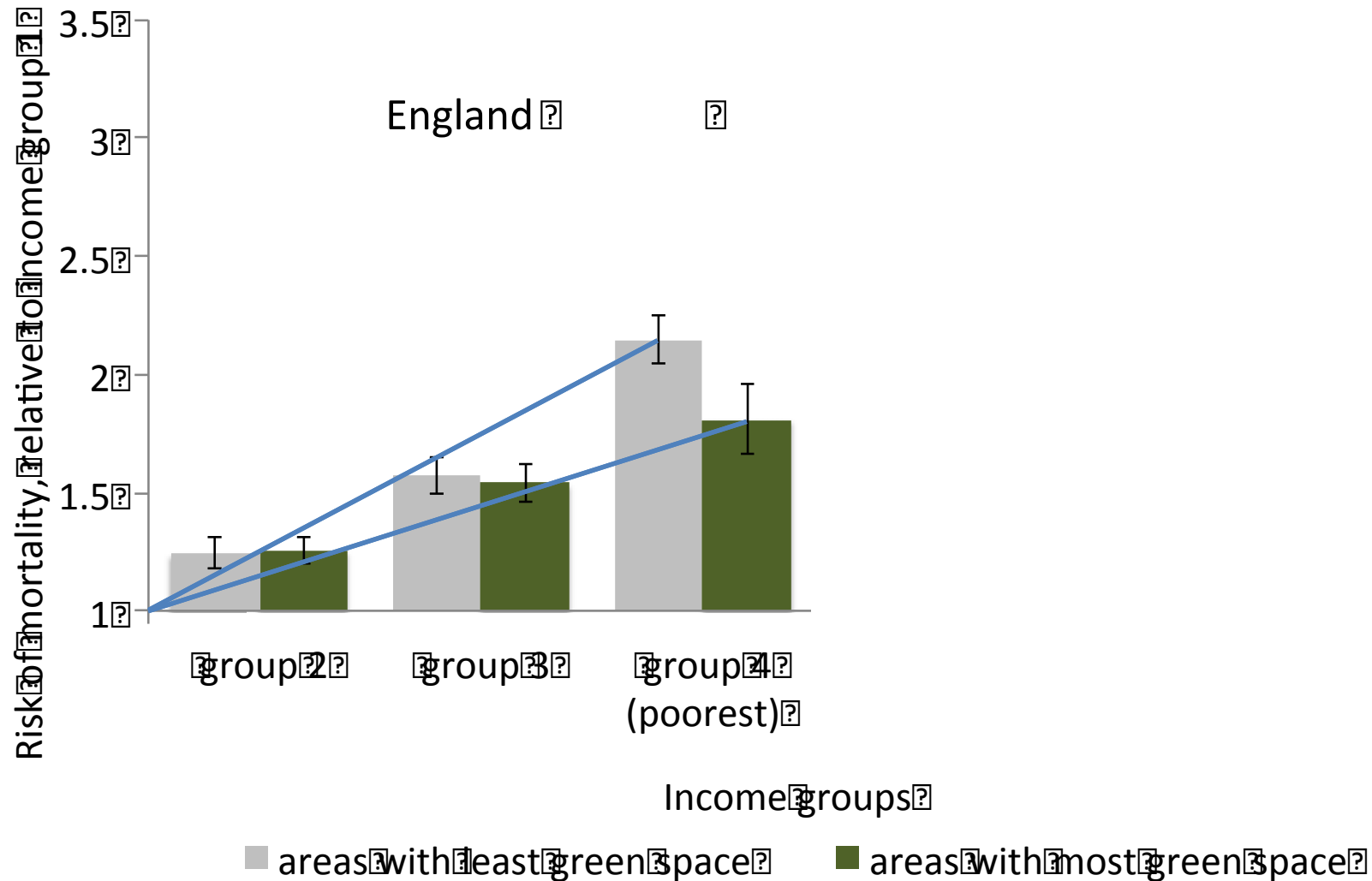


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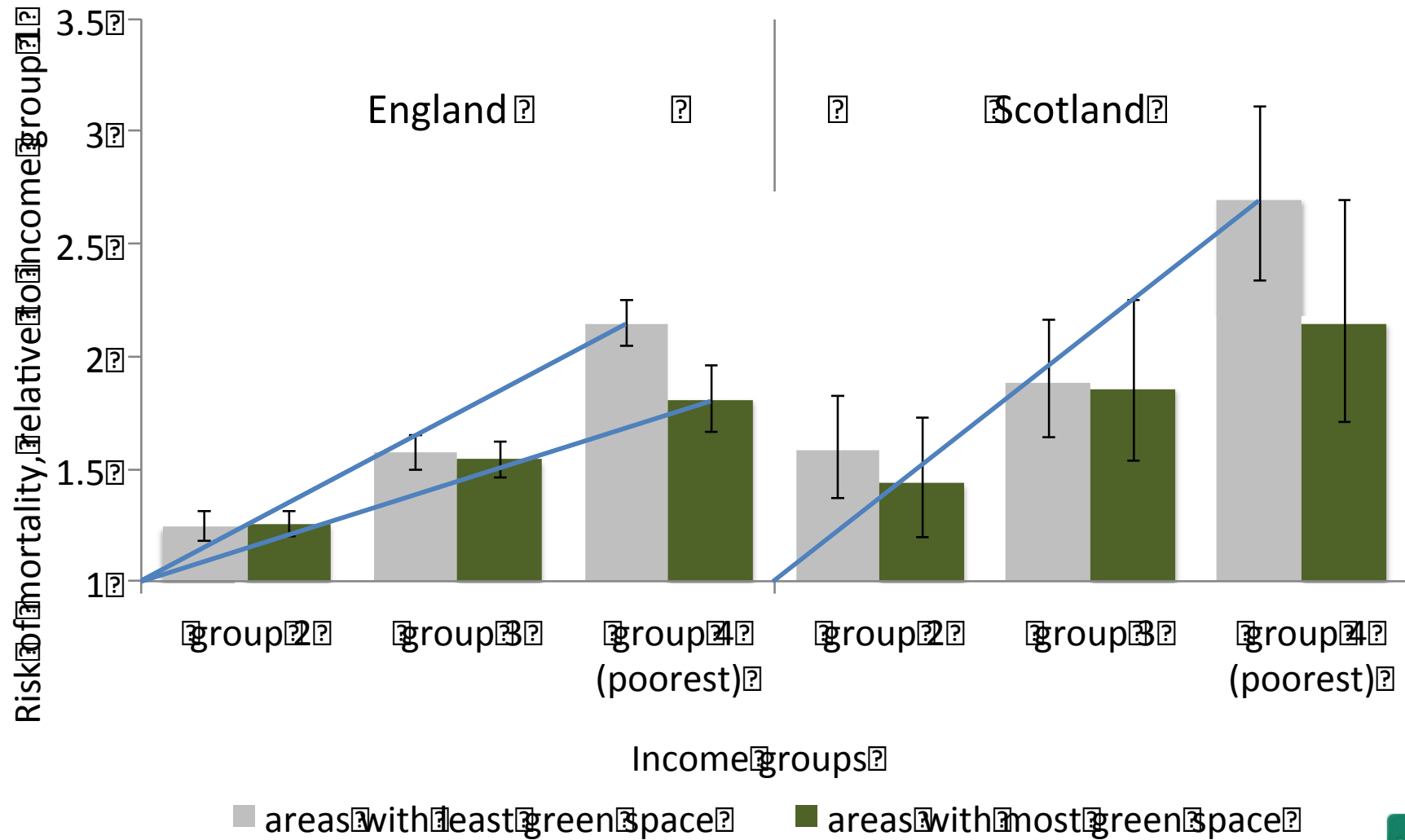




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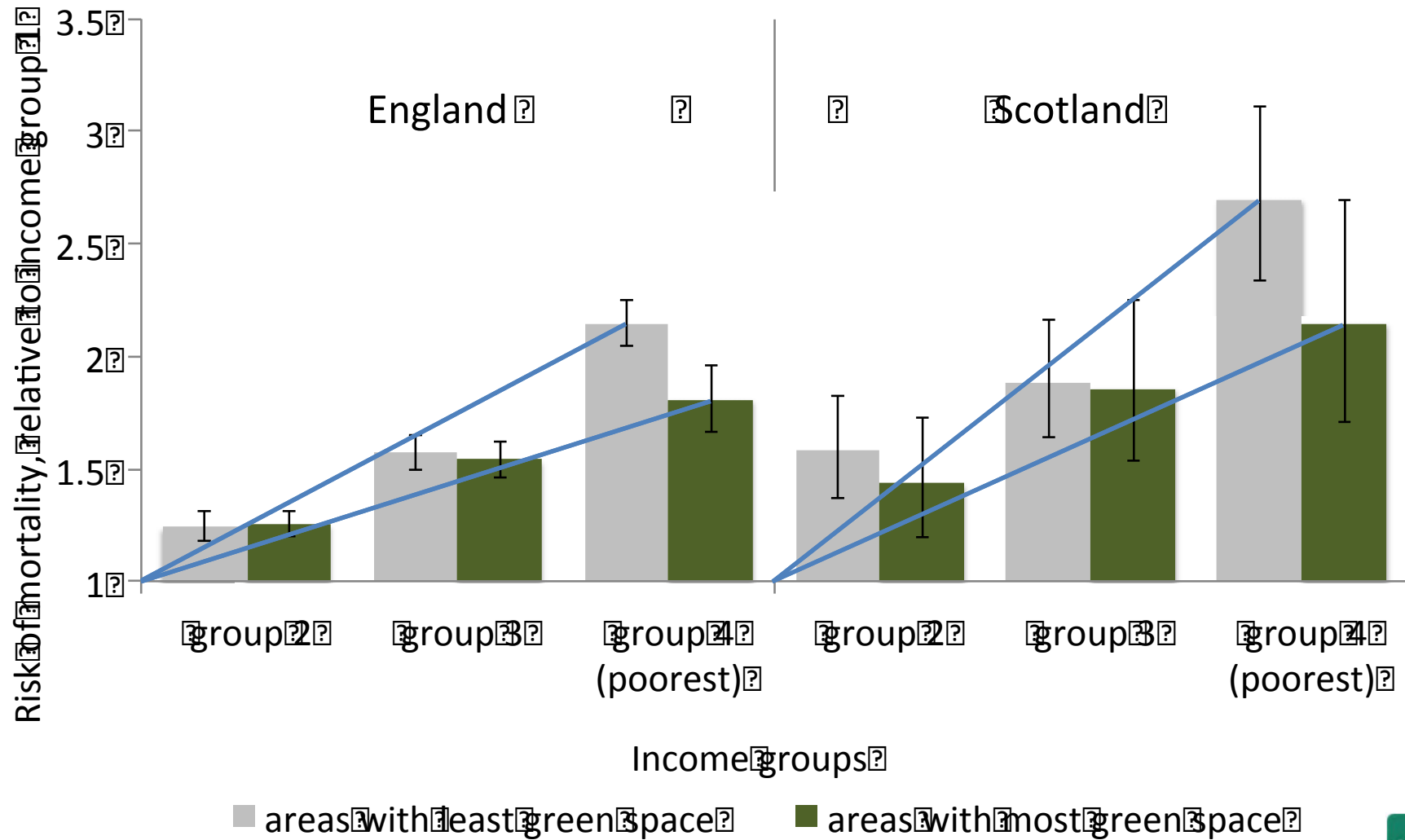


# Are they in Scotland?





A bit, but not significantly so.





So – why is there a different relationship here in Scotland?

We explored many possible explanations...

The Scottish population has a higher level of underlying poor health and risky behaviours such as smoking and drinking; perhaps these swamp any benefits of green space.

The impact of green space on risk of mortality is, even in England, relatively weak.



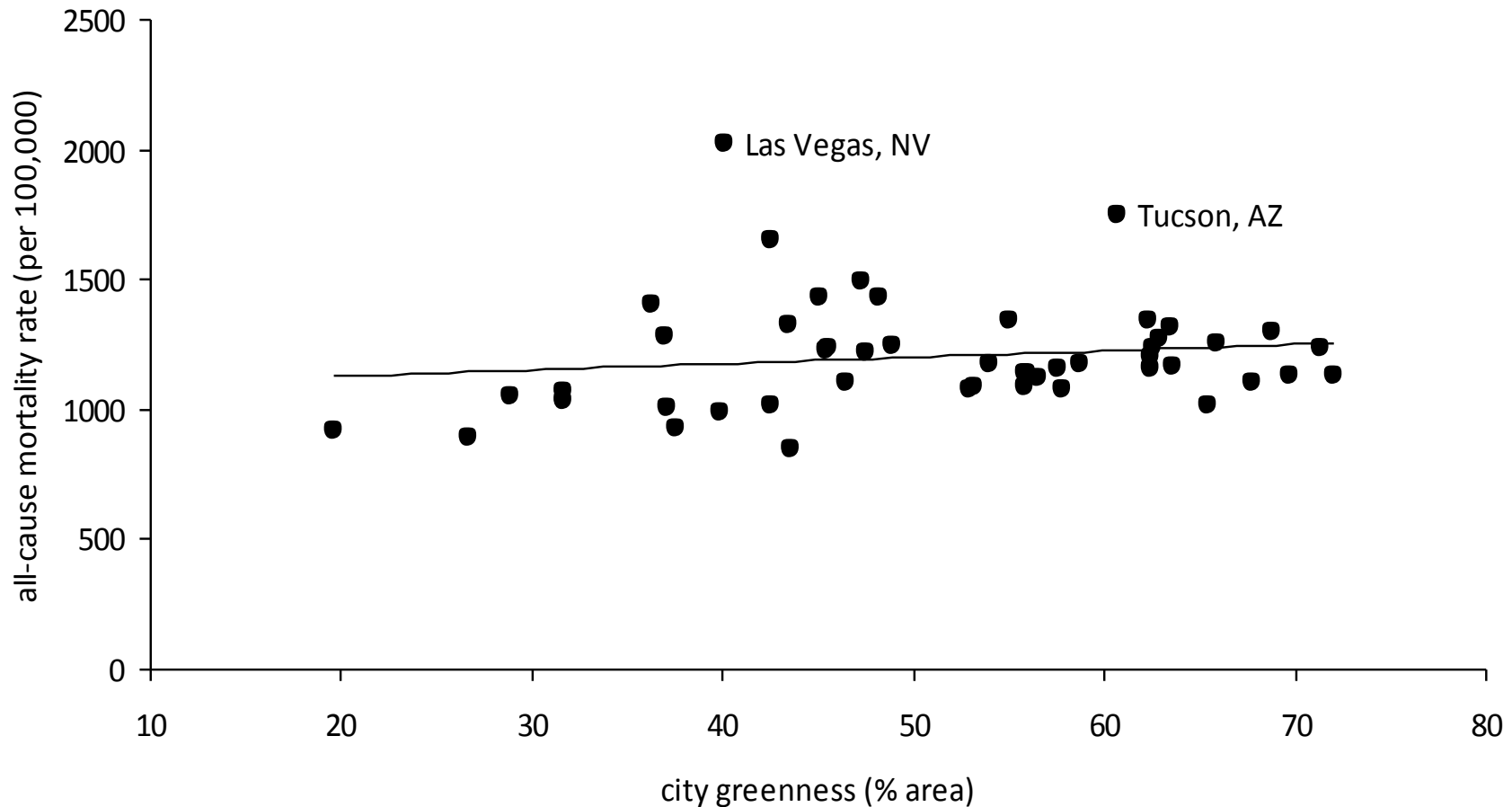
Scotland might not be so unusual. We found no associations between total, or accessible, green space in a neighbourhood and CVD mortality in New Zealand.

Richardson, E., J. Pearce, et al. "The association between green space and cause-specific mortality in urban New Zealand: an ecological analysis of green space utility." BMC Public Health 2010 **10**(1): 240.



# Greener cities in the USA actually have slightly higher mortality rates...

(a) Male



Richardson EA, Mitchell R, Hartig T, de Vries S, Astell-Burt T, Frumkin H. Green cities and health: a question of scale? Journal of Epidemiology and Community Health. 2011 doi:10.1136/jech.2011.137240









Understanding use of green spaces is important.





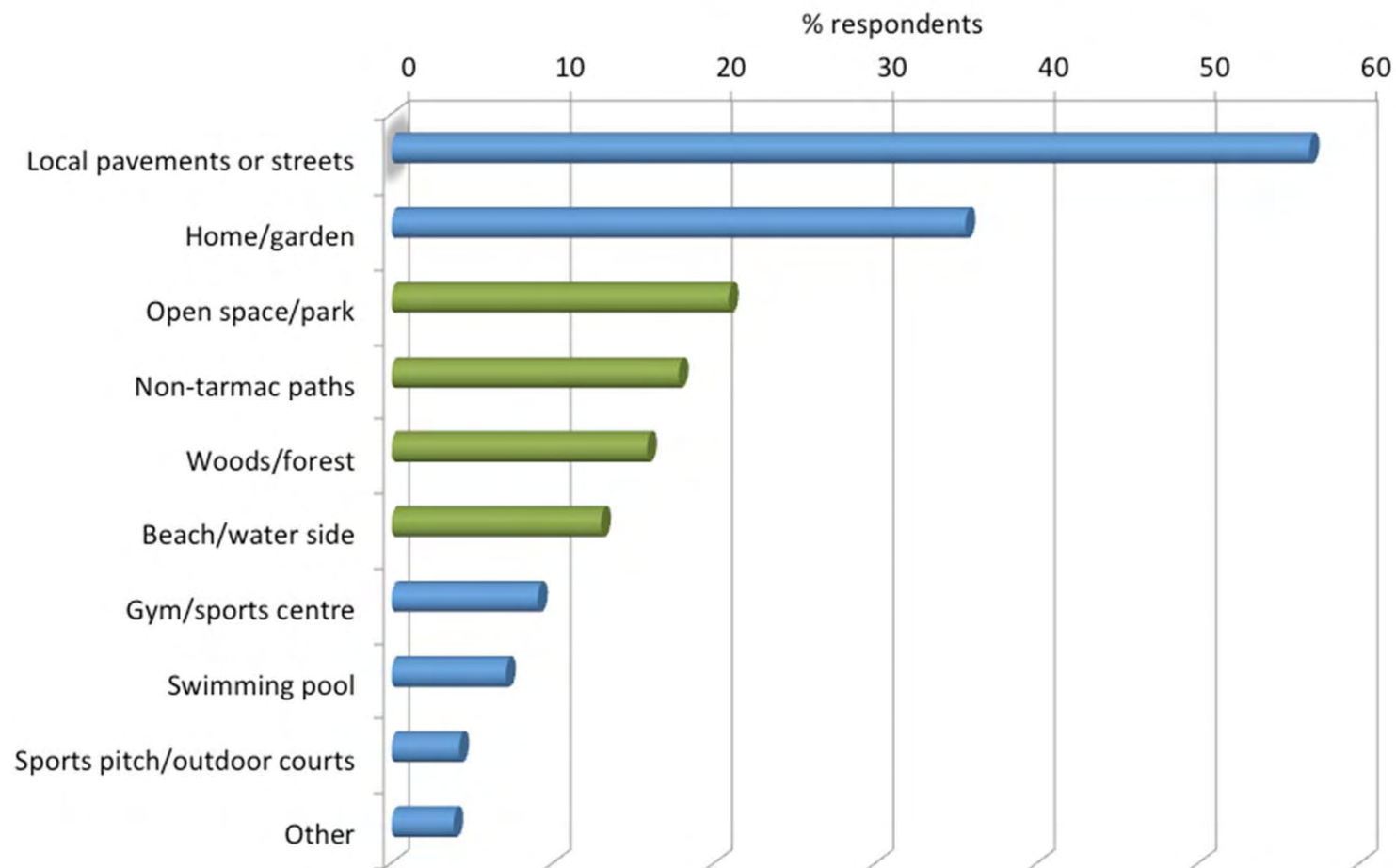
## The Scottish Health Survey, 2008; detailed questions on locations of physical activities.

Woodland  
Open space/park  
Non-tarmac paths  
Beach/river bank

Sports pitch/outdoor court  
Swimming pool  
Gym/sports centre  
Local pavements/streets  
Home/garden  
Somewhere else  
None of these places

# Where are people physically active?

Use of environment for PA at least once a week in the last 4 weeks






Is it just men that use green space?







We explored relationships between neighbourhood levels of green space &/or use of green space for physical activity, two different measures of obesity and several markers of cardiovascular and respiratory health.

We found little evidence for specific or 'extra' benefits of using green space for physical activity on these measures of health.





But, we did see apparent effects on mental health...



Images: <http://www.jamespot.com/> <http://www.courier-journal.com/>



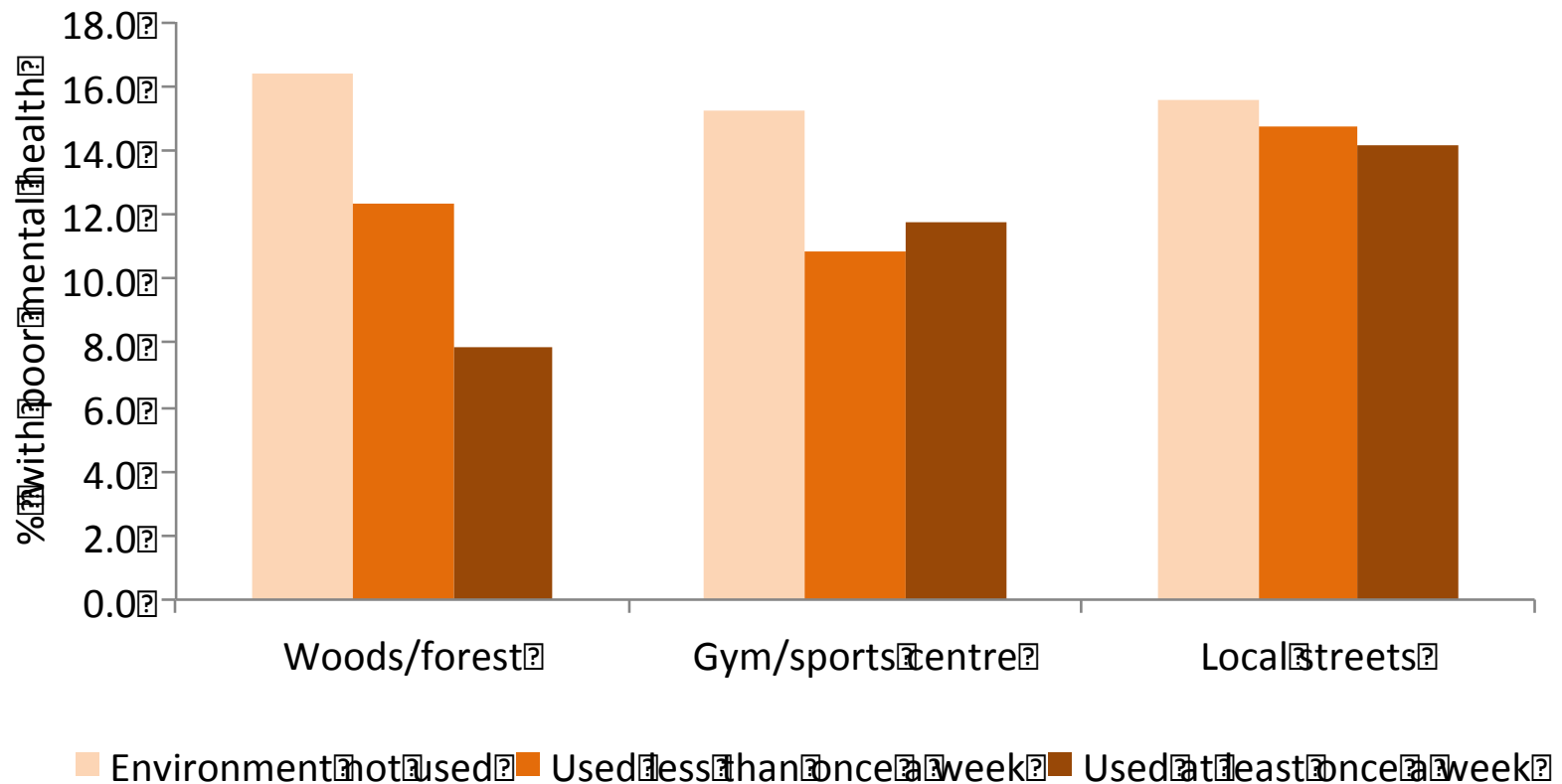
## GHQ12: Have you recently...

- Been able to concentrate
- Lost sleep over worry
- Felt you were playing useful part in things
- Felt capable of making decisions
- Felt constantly under strain
- Felt you couldn't overcome difficulties
- Been able to enjoy day-to-day activities
- Been able to face problems
- Been feeling unhappy and depressed
- Been losing confidence in self
- Been thinking of self as worthless
- Been feeling reasonably happy

More than usual, Same as usual, Less than usual, Much less than usual



## Not all environments are equally beneficial to mental health.





Using natural environments for physical activity at least once a week was associated with about half the risk of poor mental health among those who don't visit.

Each additional use of any natural environment per week was associated with about a 6% lower risk of poor mental health.



If green space is innately restorative, is that where we choose to go when we need 'to escape' everyday stress?





Simply increasing the amount of green space in urban Scotland is unlikely to affect population health or inequalities.

Regular use of green space does appear to be good for mental health. Helping people to become and stay regular users could be a useful additional means of protecting and enhancing mental health.

We should focus attention on getting people to use green space. Walking groups are an effective way to do this.

We might need to rethink what we mean by 'local' green space. Spaces outside the neighbourhood matter.