Are people healthier when they live closer to forests? A longitudinal study of Scotland

View to the North from Dundee Law

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THE UNIVERSITY of EDINBURGH · CRESH · Forestry Commission Scotland Coimisean na Coilltearachd Alba · ESRC ECONOMIC & SOCIAL RESEARCH COUNCIL · The Scottish Government

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Forests, health and inequalities
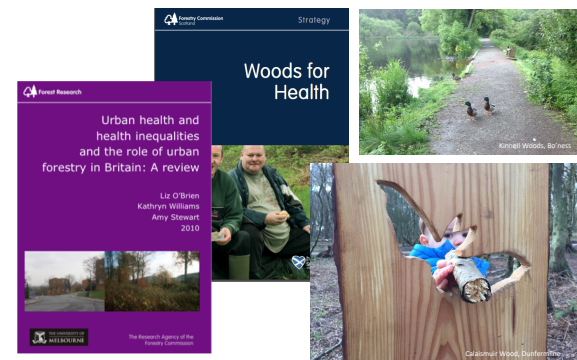
Shinrin-yoku – Forest Bathing

Park B, Tsunetsugu Y, Kasetani T, Kagawa T, Miyazaki Y. The physiological effects of Shinrin-yoku (taking in the forest atmosphere or forest bathing): evidence from field experiments in 24 forests across Japan. Environmental Health and Preventive Medicine 2010; 15(1):18-26.

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3 Key mechanisms

Physical activity

Social interaction

Mental health

Queen Elizabeth Forest Park

Are changes in forest access associated with changes in health?

- Places change over time as well as people's health
- However, a lack of longitudinal studies

Aims

- Are improvements in forest access associated with improvements in general health?

- Does the association vary between social groups?

- Does visiting forests explain the association?

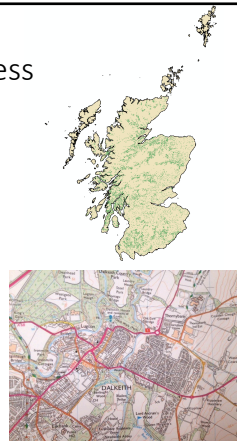Ardtornish Estate, Lochaline

Measuring forest access

20-year time period
- Census years:
  1991, 2001, 2011

Forestry data
- National Forest Inventories
- Land Cover Map
- Roads, tracks and paths
  (Ordnance Survey)

Euclidean distance to the
nearest forest was calculated
for every postcode in Scotland.

Linkage to the SLS

Distance to the nearest forest
& nearest accessible forest (m)

Postcodes for place of
residence

Scottish Longitudinal Study (SLS) - http://sls.lscs.ac.uk
- 1991, 2001, 2011 census
- 5.3% semi-random sample representative of the population

My SLS sample (n= 97, 658)
- Present at 1991, 2001 & 2011 censuses & aged 18+ in 1991
- Excluded those living on islands, in communal
  establishments & with missing data.

Exploring forest access and health

1. Random-effects model

Access to forests
(0-<150m, 150-<300m, 300-<500m,
500-<750m, 750-<1500m,
>=1500m)

Has a long-term
illness
(yes/no)

2. Hybrid-effects model

Within-person change in forest access
(deviation from person specific mean)

Between-person variation in forest
access (person-specific mean)

Has a long-term
illness
(yes/no)

Models controlled for age group, gender, ethnicity, children in the household,
highest-level education, housing tenure, urban rural classification and coastal
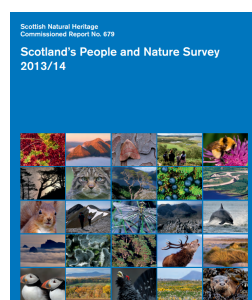proximity.

Differences between groups

Models were stratified by age group, gender, highest-level education, urban
rural classification (2-fold) and the Carstairs deprivation index (quintiles)

Estimating forest use

"In the last 12 months how often have you
visited forests or woodlands for walks,
picnics or other recreation?" (n=4694)

- 41% visited forests at least monthly

Age   Ethnicity   Tenure

Probabilities of visiting forests at least
monthly

Scottish Natural Heritage
Commissioned Report No. 679

Scotland's People and Nature Survey
2013/14

Mediation analysis

A   Visiting
forests   B

Access to
forests   C   Long-term
illness

The direct pathway (C) and the potential mediating role of
visiting forests (A+B) in the relationship between forest access
and health.

Were people healthier when they lived closer to forests?

No…

Random-effects model
- People improving forest access (from >1500m to <150m) had better health.

Hybrid-effects model
- Variation due to differences between those with and without good forest access rather than changes.

Source: Scottish Longitudinal Study (SLS)
Findings are provisional and not available for dissemination or publication.

Differences between forest types and social groups

- Accessible forests had slightly stronger associations with reducing likelihood of long-term illness.

- Men and those without qualifications benefited more from living closer to forests.

- Within-person change insignificant for all sub-groups.

Source: Scottish Longitudinal Study (SLS)
Findings are provisional and not available for dissemination or publication.

Did visiting forests explain the association?

To some extent…

- Likelihood of visiting forests monthly significantly increased as forest access improved.

- Effect of forest access on health reduced in size when forest use added to the model suggesting partial mediation.

Source: Scottish Longitudinal Study (SLS)
Findings are provisional and not available for dissemination or publication.

A few discussion points…

- Improvements in forest access did not improve health, why?

- Why did men and low SES benefit more?

- What about other mediators?

Some limitations…
- Synthetic estimate
- Time points
- Childhood experiences

Acknowledgements

Thanks for listening. Any questions?

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