Mapping influences of Green Infrastructure on population health across socio-demographic gradients in Greater Manchester

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Green Infrastructure and the Health and wellbeing Influences on an Ageing population (GHIA)

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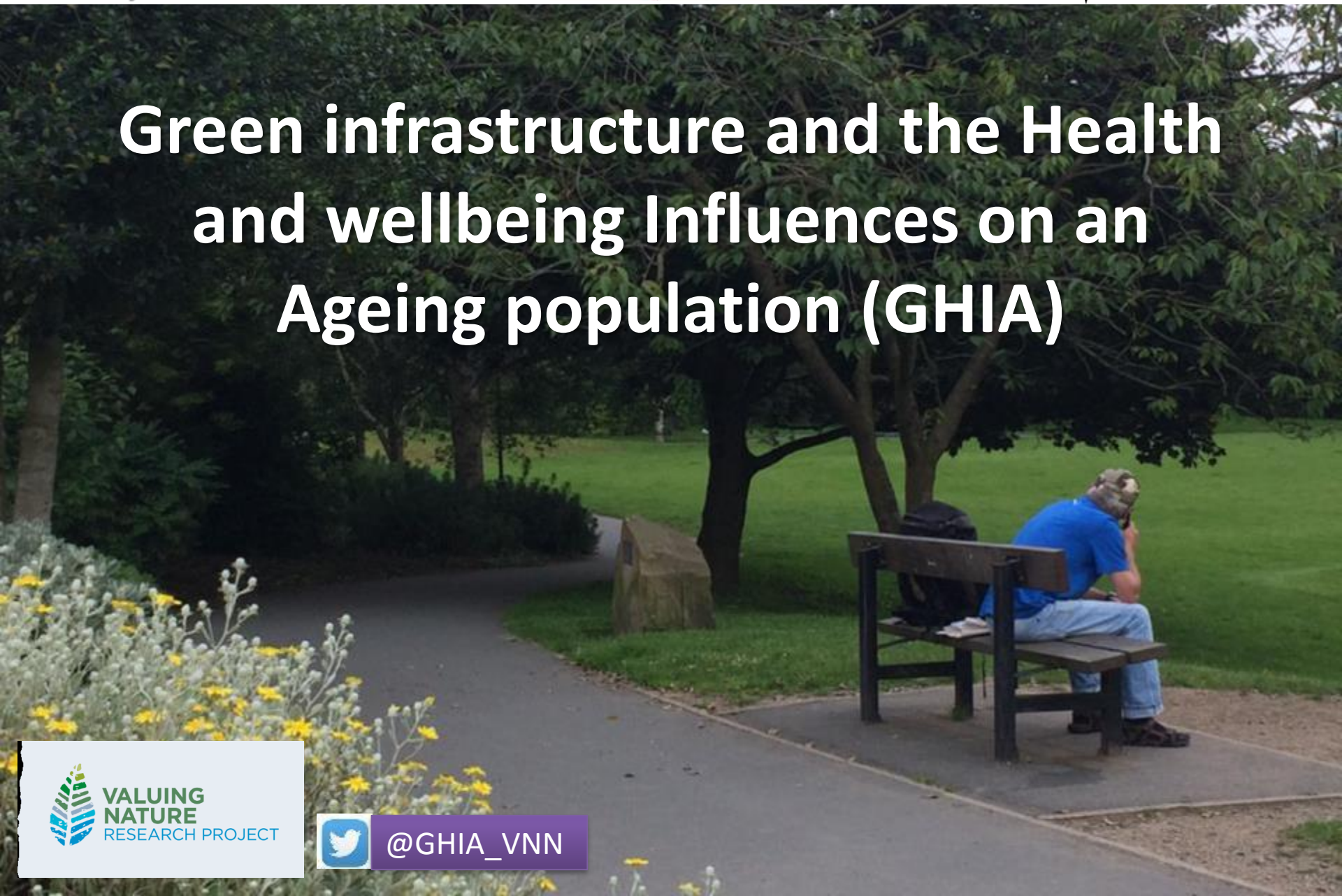

VALUING NATURE RESEARCH PROJECT

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The GHIA aim

- To better understand the benefits and values of urban GI to older people and how GI attributes and interventions can best support healthy ageing in urban areas.

Greater Manchester as the case study

Natural experiments

Older adults as co-researchers

Arts and heritage approach

Multiple perspectives on values for wellbeing

Issues with green urban-rural land-cover characterization in health studies

- ***"green space" as catch-all (though with significant gaps).***
- ***Percentage cover as standard measure***
- ***Little consideration of shape, patch or diversity. E.g. Mitchell & Popham (2007) and Stott et al. (2016) emphasize larger green spaces towards human well-being but do not consider spatial configurations.***
- ***Few studies of multiple green-cover types***
- ***(Street) trees especially under-considered***
- ***Emphasis on mediating socio-economic factors over nuance in terms of landscape content, context or distribution***

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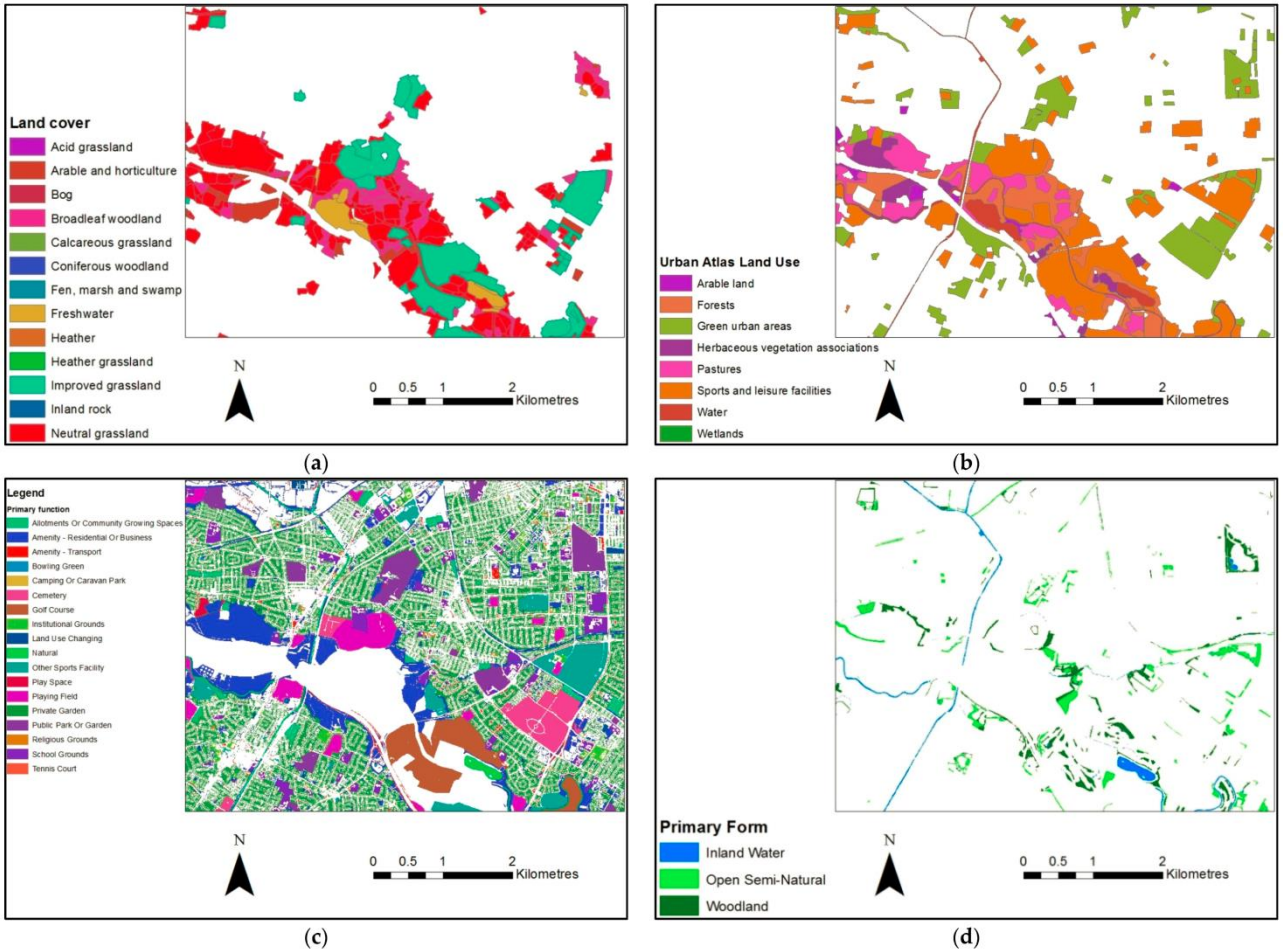
Existing GI datasets a) Land Cover Map 2015, b) Urban Atlas 2012, OS Greenspace Layer: c) function and d) form



Source: Dennis, M., Barlow, D., Cavan, G., Cook, P.A., Gilchrist, A., Handley, J., James, P., Thompson, J., Tzoulas, K., Wheater, C.P. and Lindley, S., 2018. Mapping urban green infrastructure: A novel landscape-based approach to incorporating land use and land cover in the mapping of human-dominated systems. *Land*, *7*(1), p.17.

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Land-use processing

OS Mastermap Greenspace Layer

Generalized land-use themes:
- Public parks and recreation
- Amenity
- Private gardens
- Institutional land
- Brownfield land

Mosaic with OS Topography Layer (2017) private gardens data and OS open access Greenspace layer (2017)

Land-cover assessment

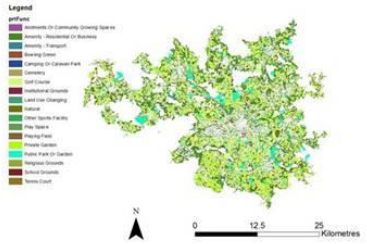
Sentinel 2A (2015) 10 m satellite remote sensed imagery

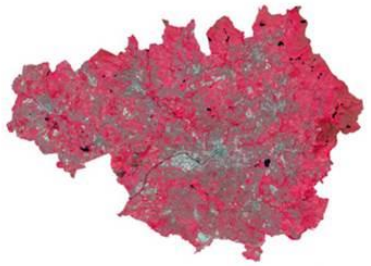
Supervised classification using training samples

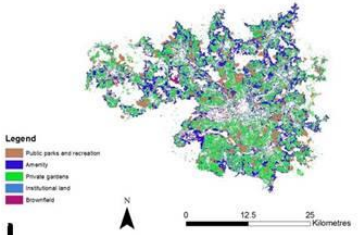
Integrate with City of Trees GM Tree Audit dataset (2011) and Ordnance Survey water (canal, river, open water) layer (OS VectorMap Local, 1:10,000).

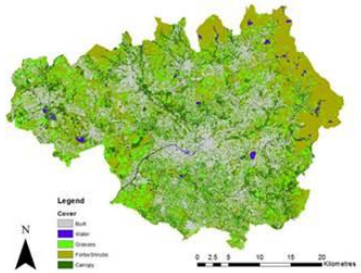
Cross-validation and final manual cell editing.

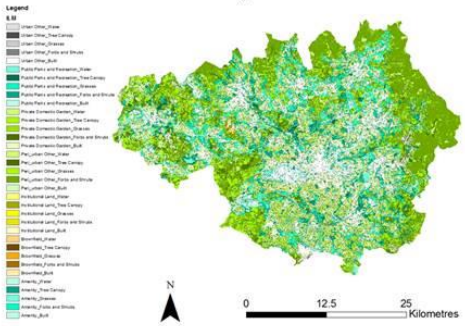
Map algebra and final classification











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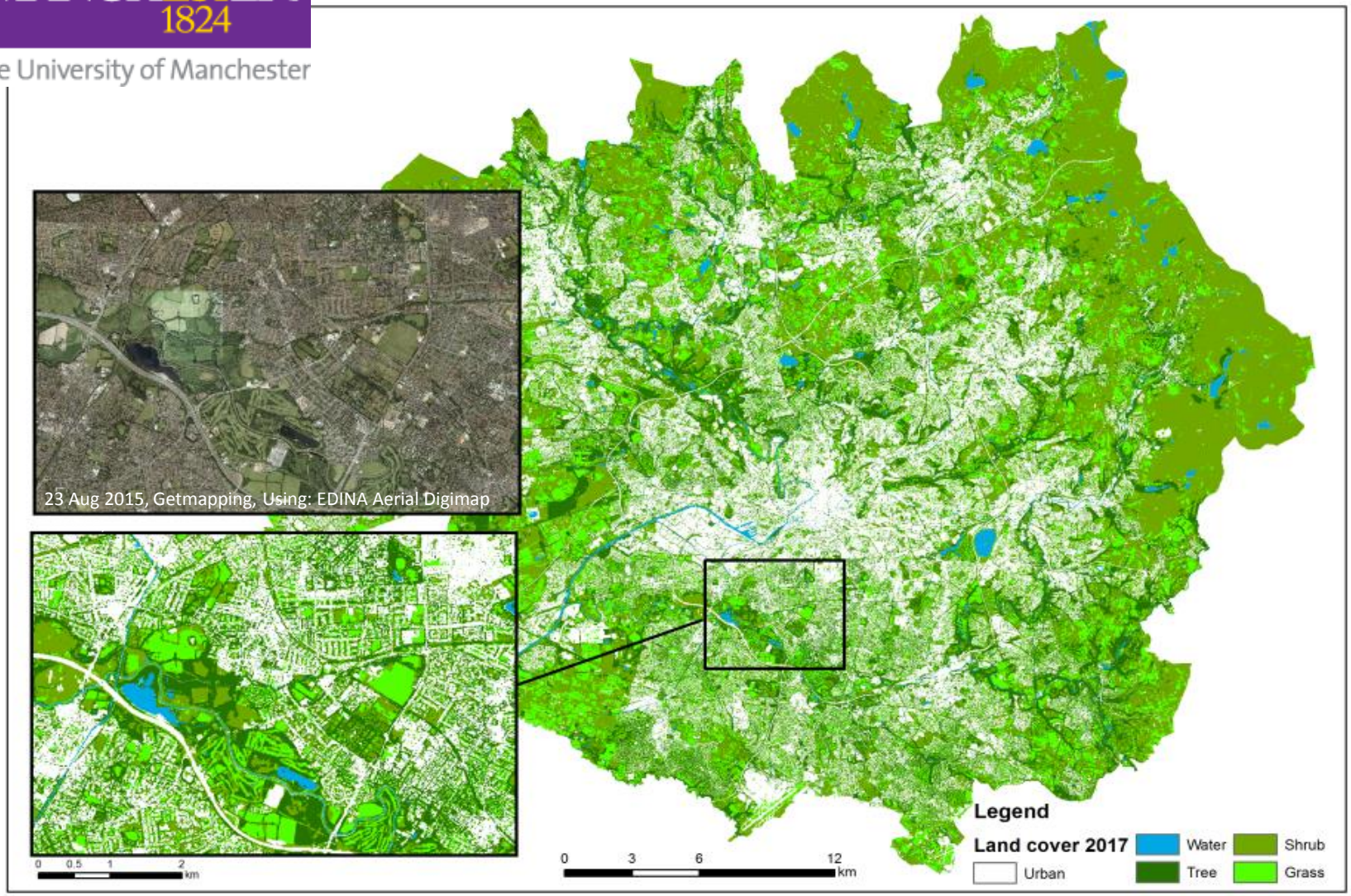

Source: GHIA Project (2018) derived from Sentinel 2A, City of Trees canopy & OS VectorMap Local data. Funders: Natural Environment Research Council, the Arts and Humanities Research Council and the Economic and Social Research Council under the Valuing Nature Programme. NE/N013530/1

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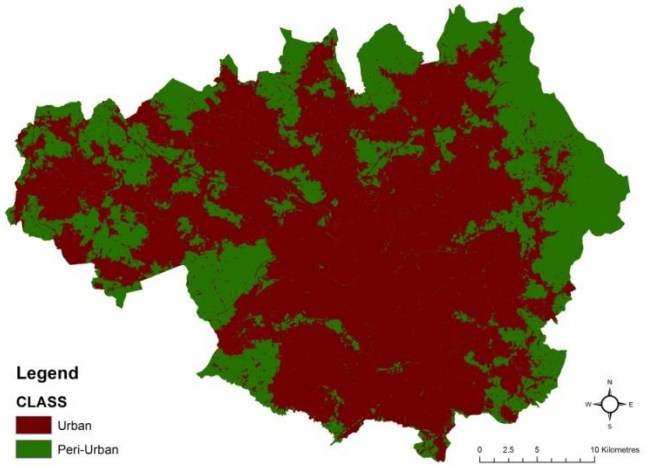
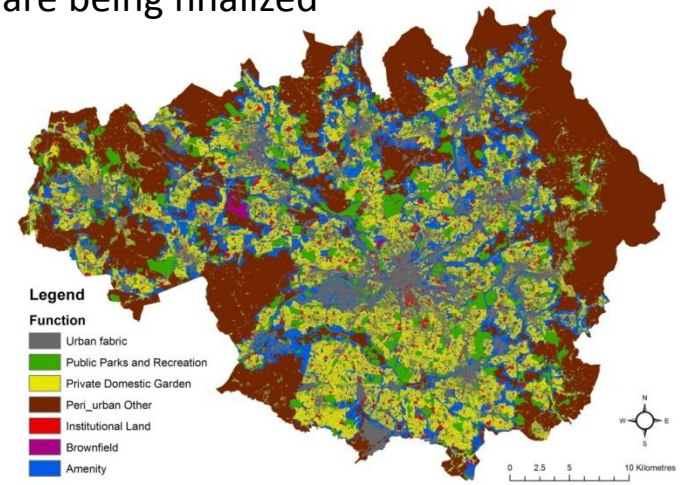
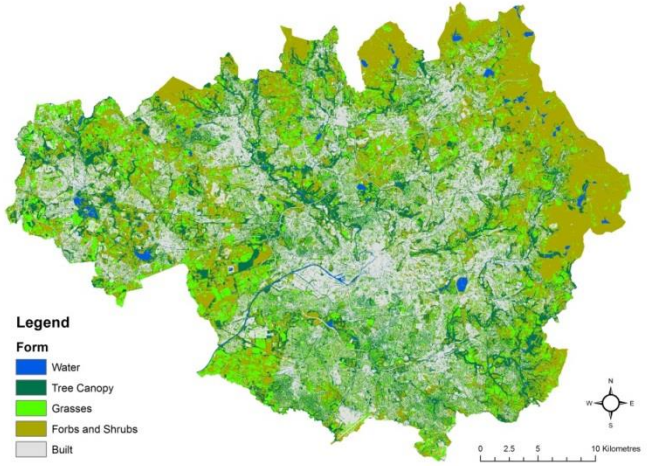
- Source data are available in open access format (link in the publication: http://huckg.is/d/ILM_Open.zip
- Interactive maps based on ward-level data can be viewed at ghia.org.uk
- Licencing arrangement for access to the full dataset are being finalized



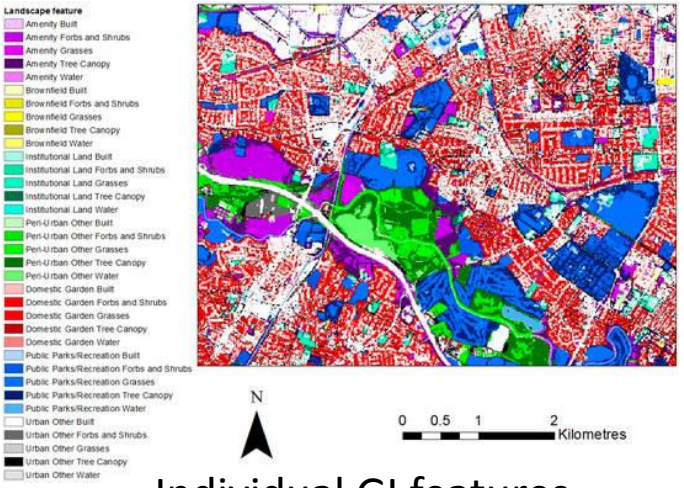
Urbanity



Function



Form

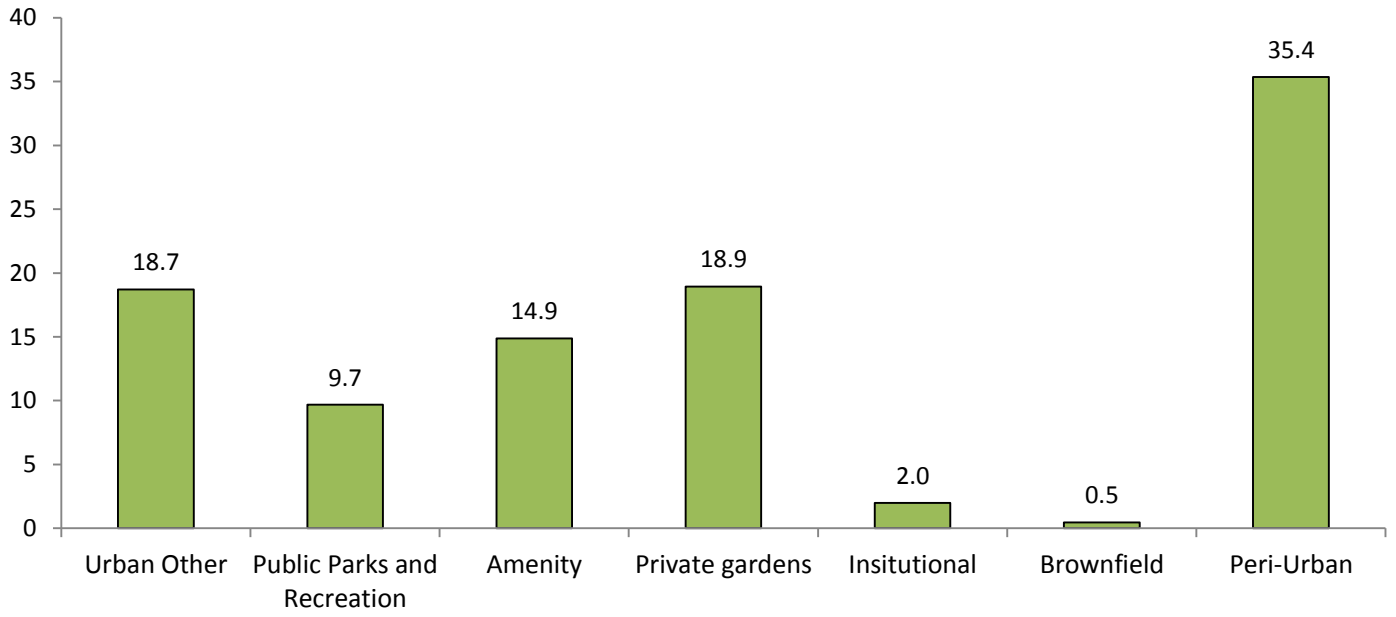


Individual GI features

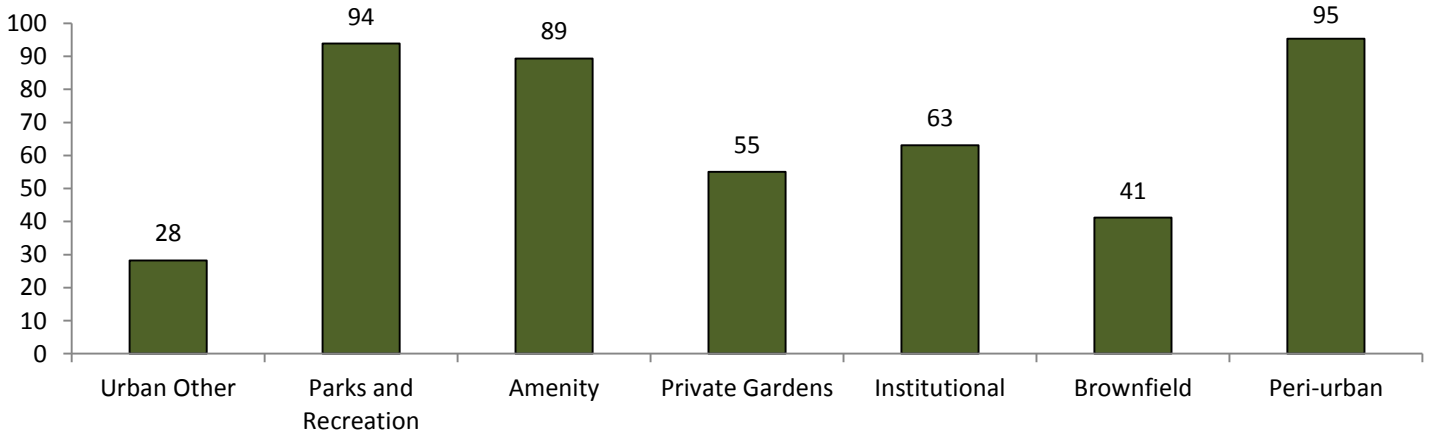
Source: University of Manchester GHIA Project 2018. Derived from Ordnance Survey Mastermap Greenspace Layer, OS Open Rivers, OS Open Greenspace, European Space Agency (Sentinel 2A), Natural Environment Research Council (CEH) Land Cover Map and City of Trees Tree Audit data. Funders: Natural Environment Research Council, the Arts and Humanities Research Council and the Economic and Social Research Council under the Valuing Nature Programme. NE/N013530/1

What does Green Infrastructure in Greater Manchester look like?

% GM associated with each GI type



% Green land-cover by GI type



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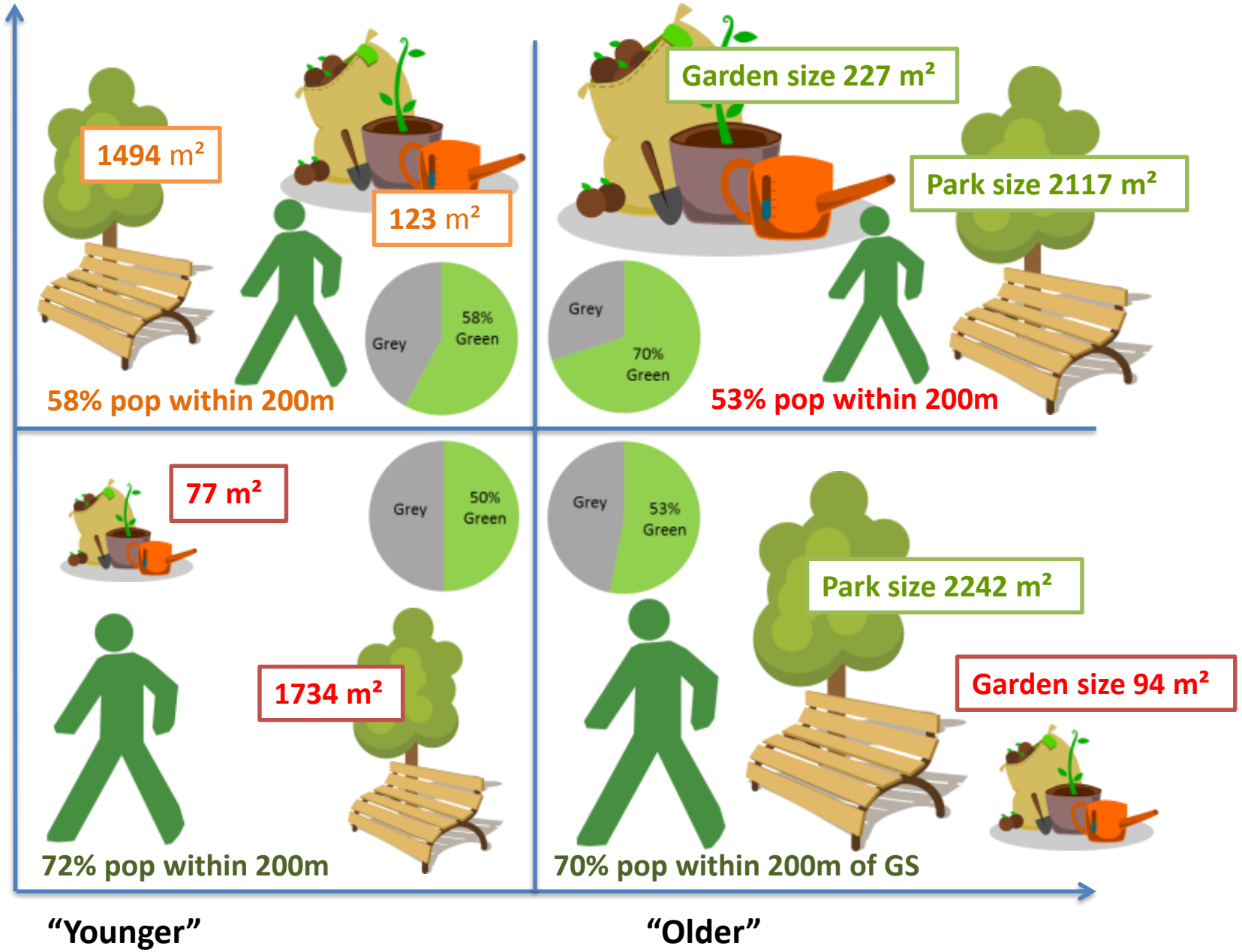
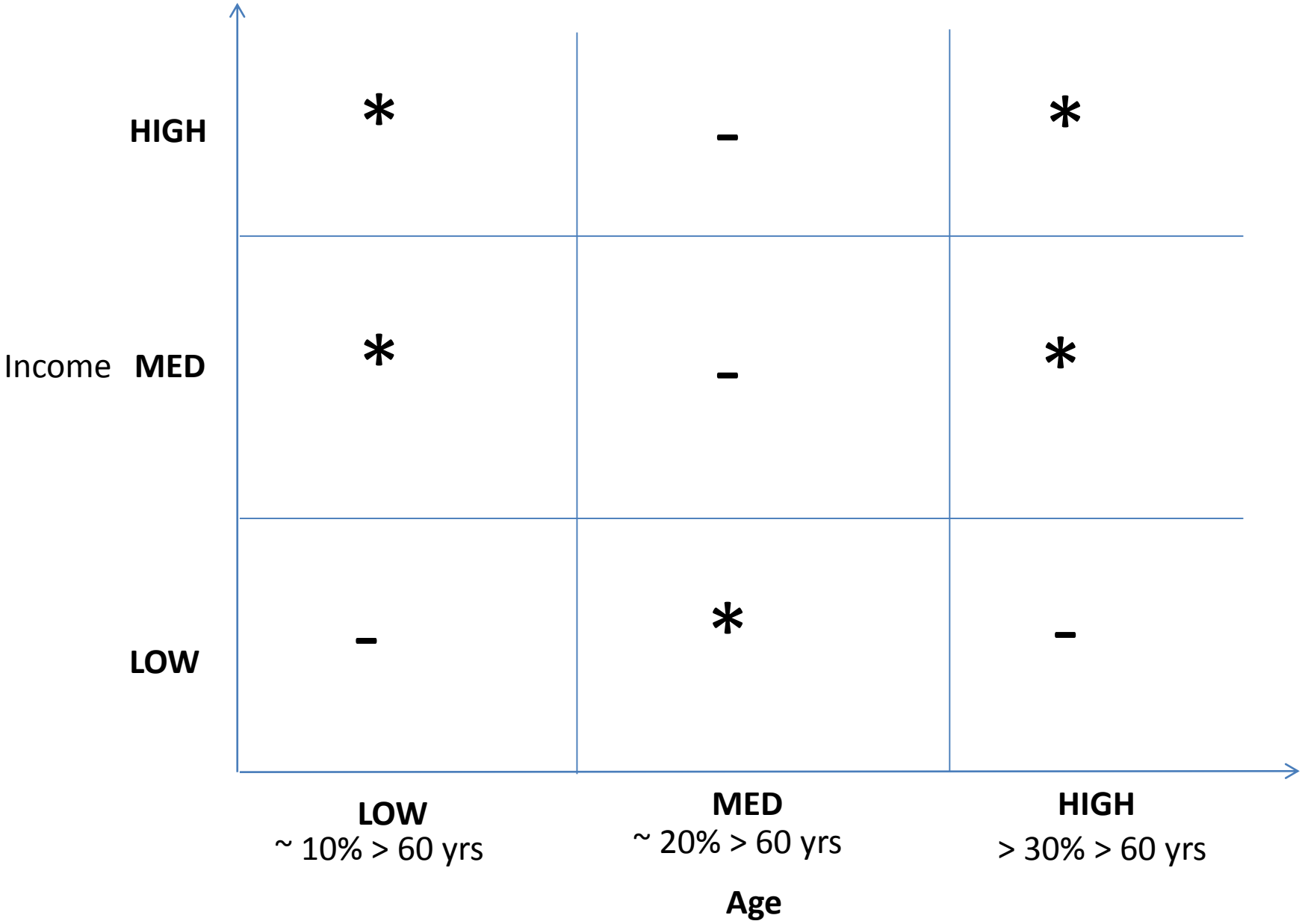
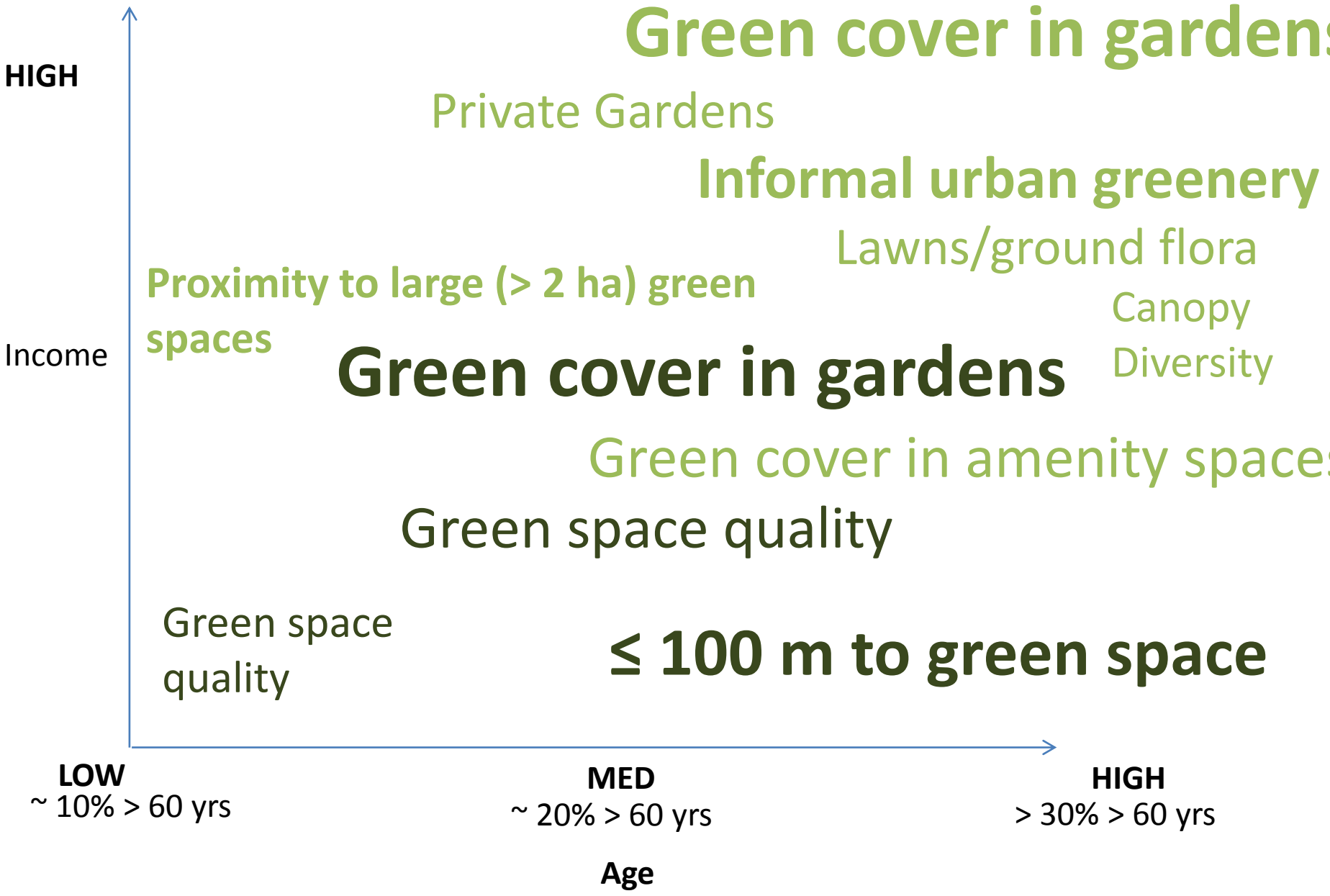
What does GI in GM look like for different groups?



GI and population morbidity (comparative Illness and disability ratio) across income and age gradients



GI associations with population morbidity (comparative Illness and disability ratio) across income and age gradients



Headline: Size, quality and proximity influence the relationship between green infrastructure and population morbidity across gradients of income and age

Novelty: A comprehensive, integrated appraisal of the social-ecological (physical, spatial, socio-economic and demographic) factors at work within patterns of association between GI and morbidity in Greater Manchester

Key findings:

1. Local accessible green spaces and neighbourhood greenery significant in older age groups (gardens and amenity space significant but relationship appears to be subject to thresholds related to size and degree of greening i.e. % green land-cover)

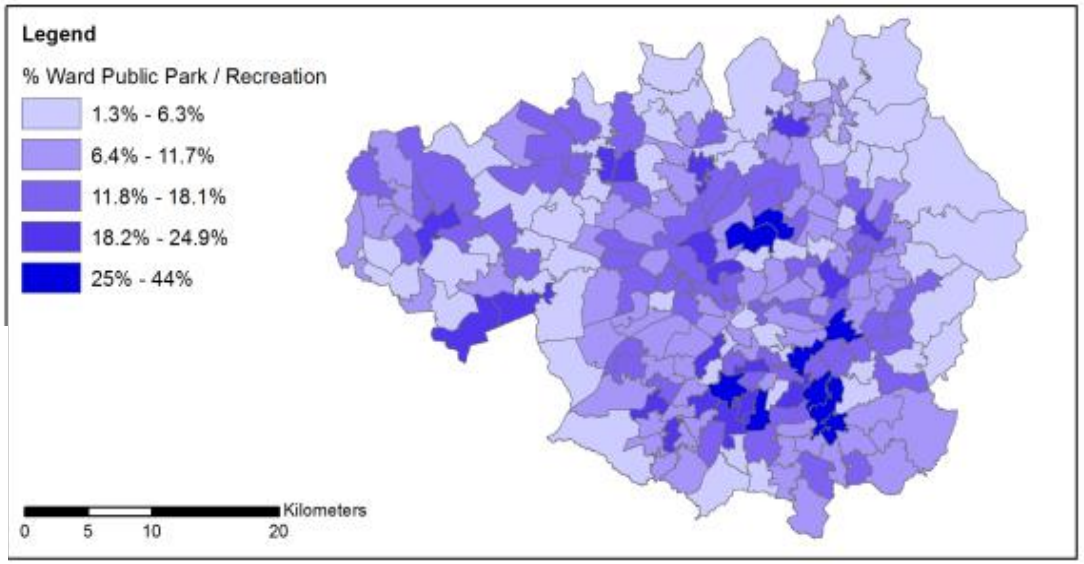
2. Large recreational green spaces may buffer against poor health in otherwise highly urbanized/fragmented areas (associated with “younger” areas)

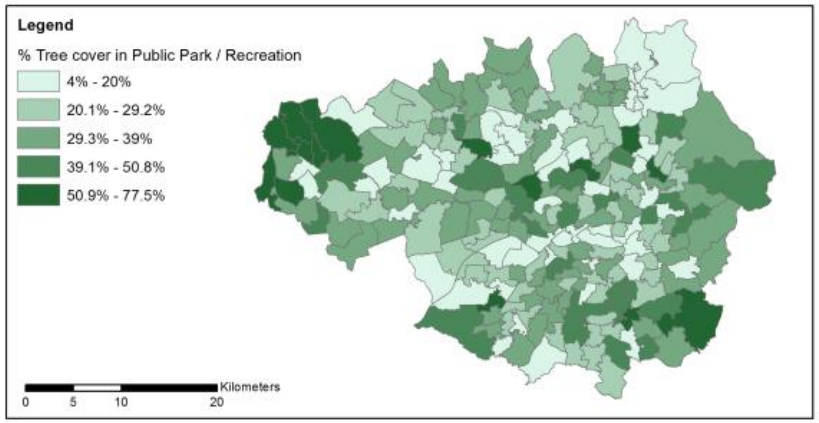
3. Vegetation quality as a critical variable especially in low income areas and areas with low GI-cover

Other related outputs:

- Integrated, high resolution GI dataset (already employed in external research and policy settings)
- Socio-environmental typologies of neighbourhoods in Greater Manchester
- Interactive maps of GI and GI-related benefits, provision and need (Work Package 5, forthcoming)

> 30% Public Park & Recreation
Higher Blackley
Chorlton Park
Audenshaw
South Middleton
Manor
Reddish South





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Thank you!

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