

Contextual effects at multiple spatial scales for the full population of the Netherlands

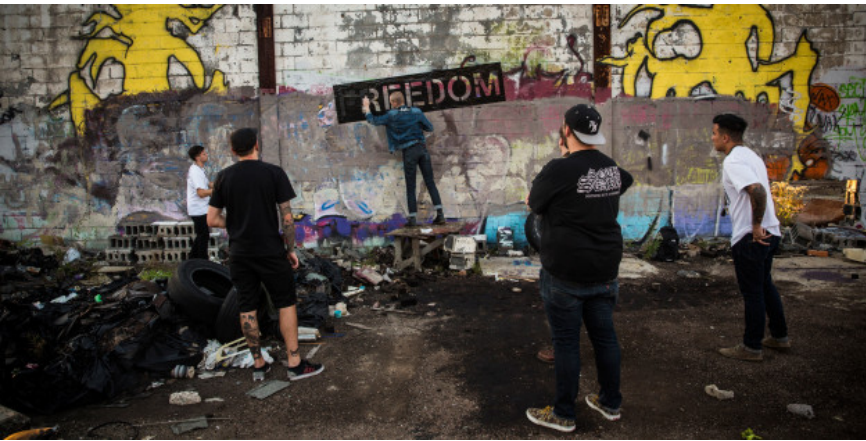
Ana Petrović, Delft University of Technology

Prof. Maarten van Ham, Delft University of Technology, University of St Andrews

Prof. David Manley, University of Bristol

Informatiebijeenkomst virtual research environment (VRE)

Utrecht, 15 October 2019



<https://airfreshener.club/quotes/detroit-michigan-poverty.html>



<http://www.landlordreferencing.co.uk/blog/them-next-door-vetting-your-tenants-future-neighbours/#>



<https://www.lovemon ey.com/galleries/81646/rich-city-poor-city-where-prosperity-and-poverty-are-neighbours?page=31>

Peer group
effects in
residential
context

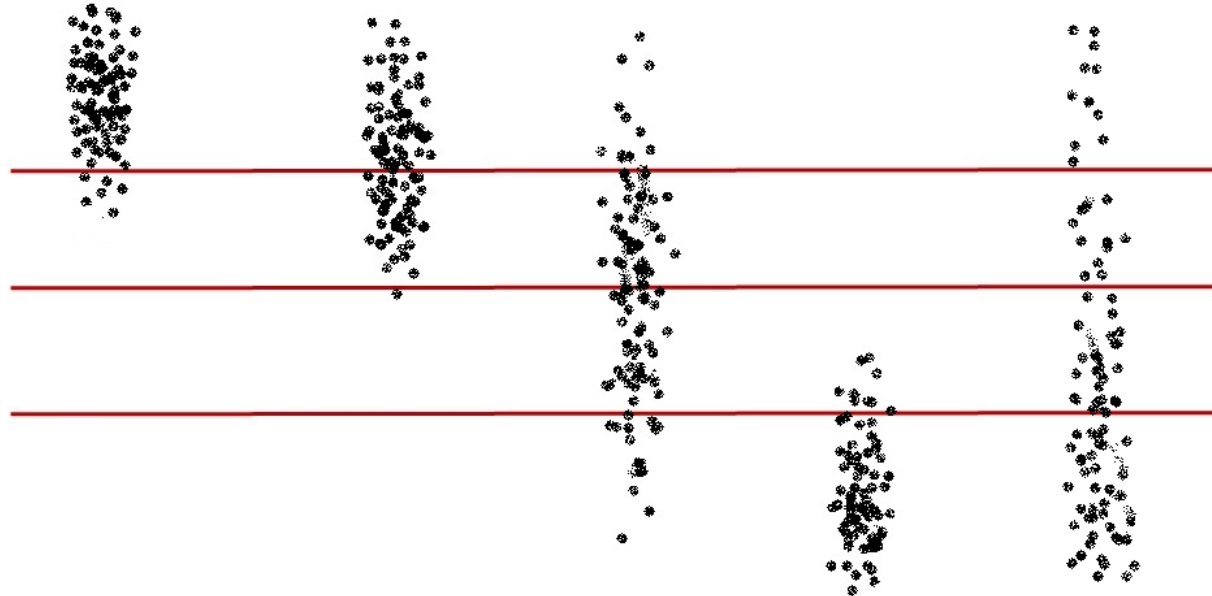
Peer group
effects in
school

Stigmati-
sation

Regional
labour
markets

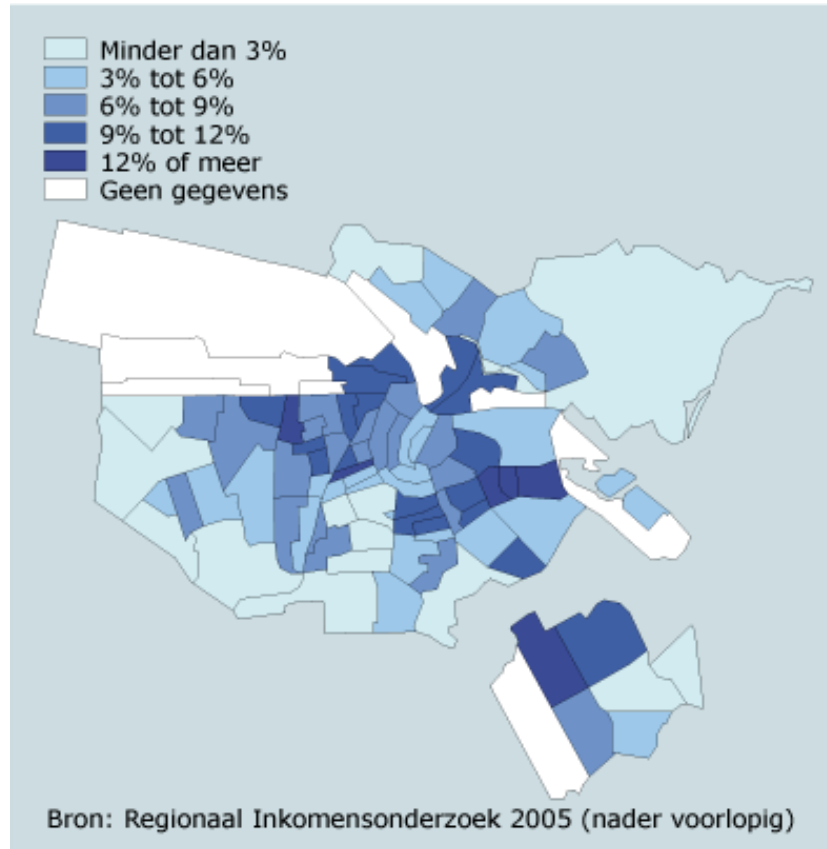
Environmental
hazards

Immediate
surrounding
of home



Urban region

Share of low-income people in Amsterdam neighbourhoods



Aim of our research

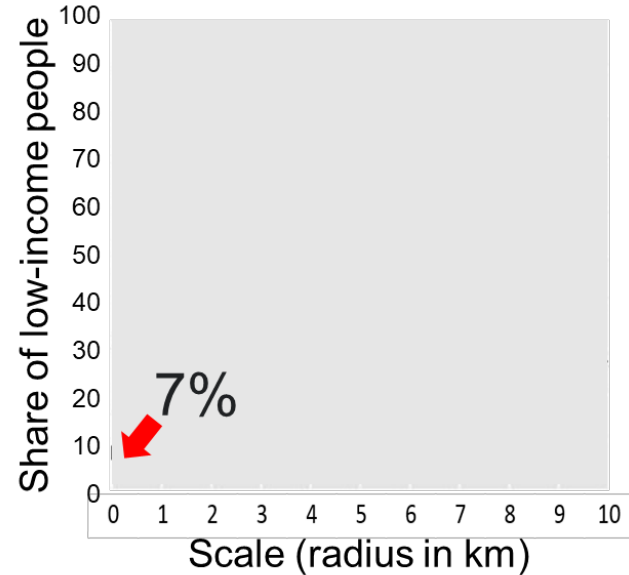
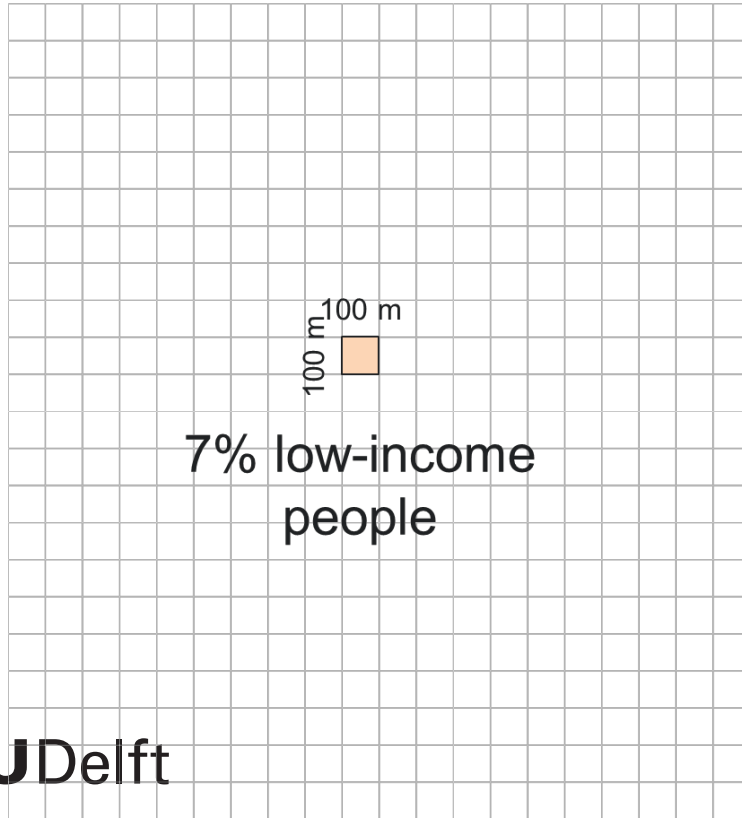
To better understand the effect of spatial inequality on individual socioeconomic status

- To operationalise residential context at multiple spatial scales (from 100m by 100m grid cells up to areas with 10km radius)



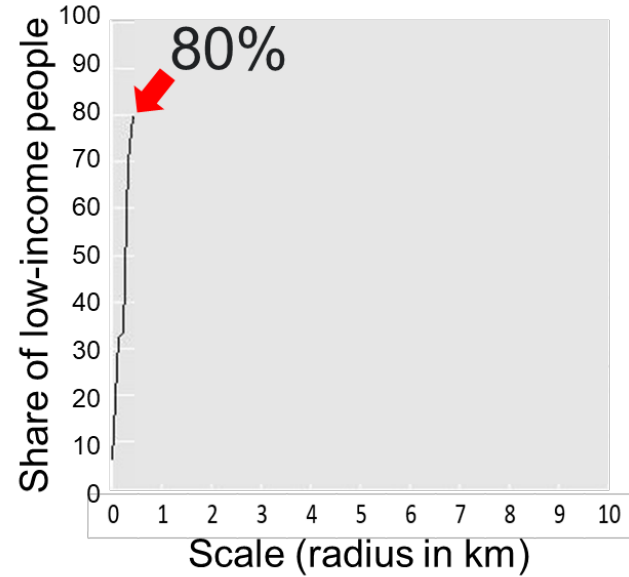
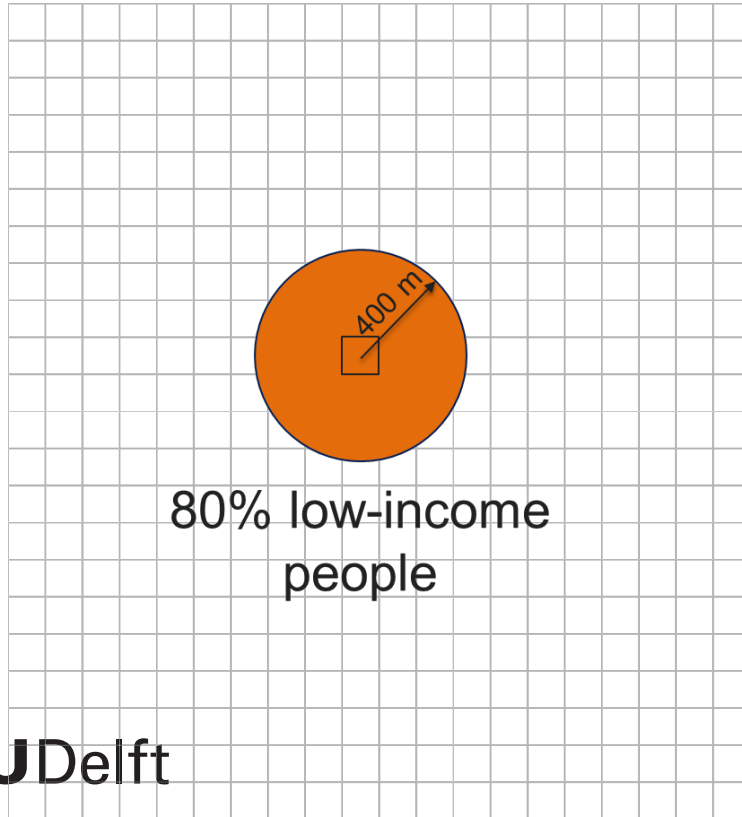
- To follow people over multiple years and model the effect of residential context on individual income

Exposure to spatial context at 101 scales



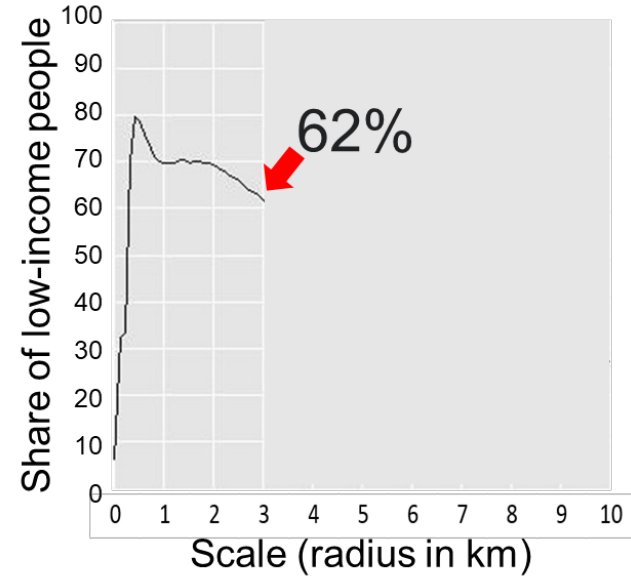
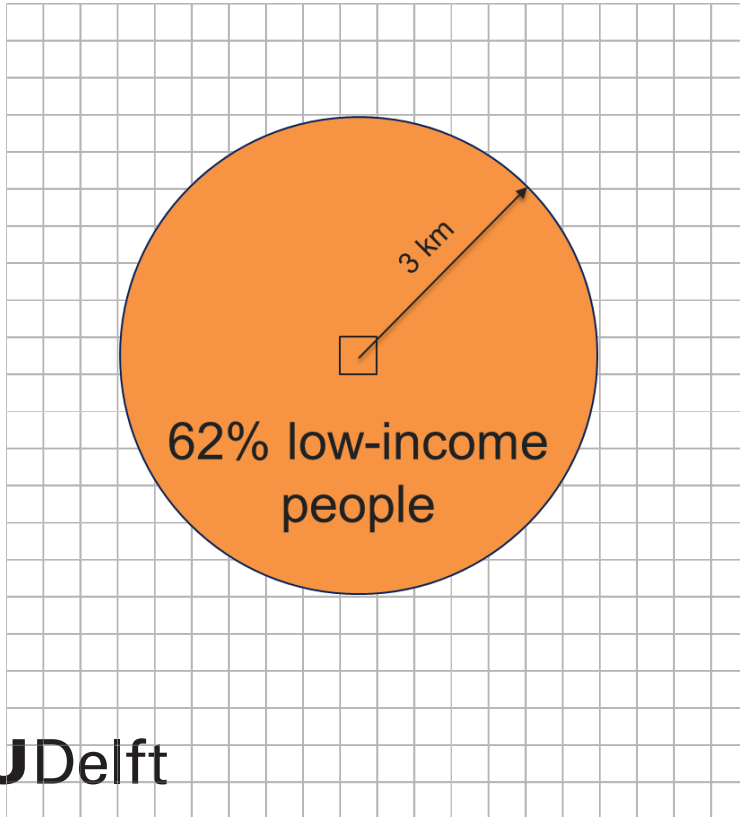
(see Petrović, van Ham, & Manley, 2018)

Exposure to spatial context at 101 scales



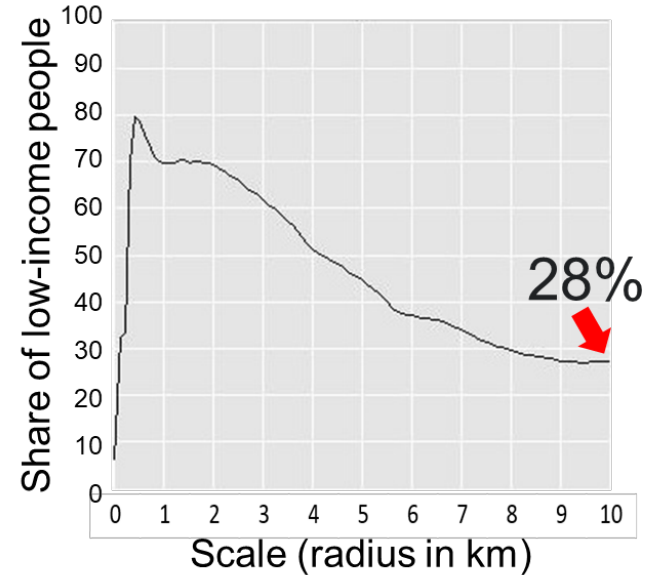
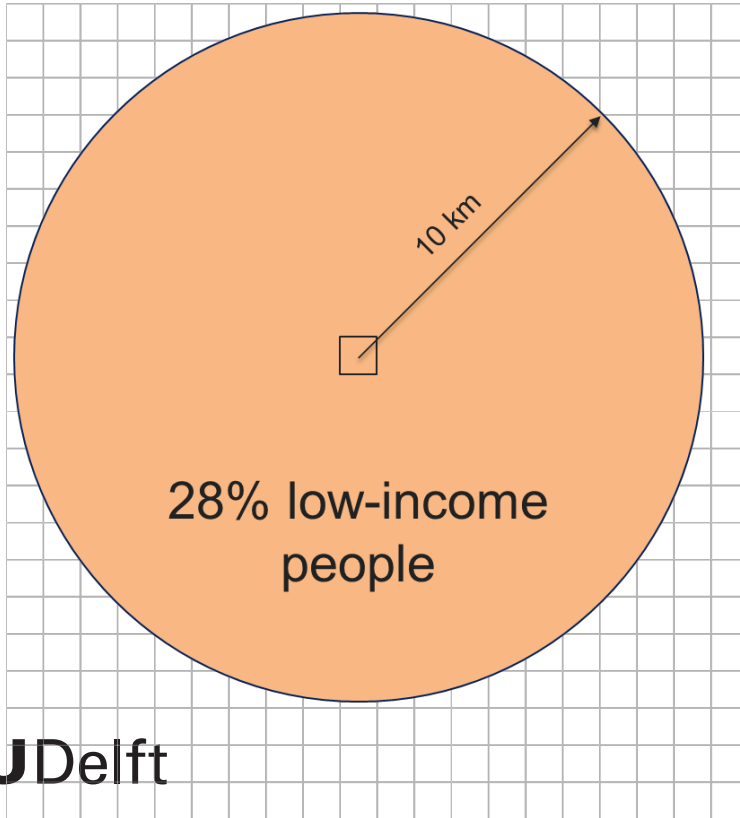
(see Petrović, van Ham, & Manley, 2018)

Exposure to spatial context at 101 scales



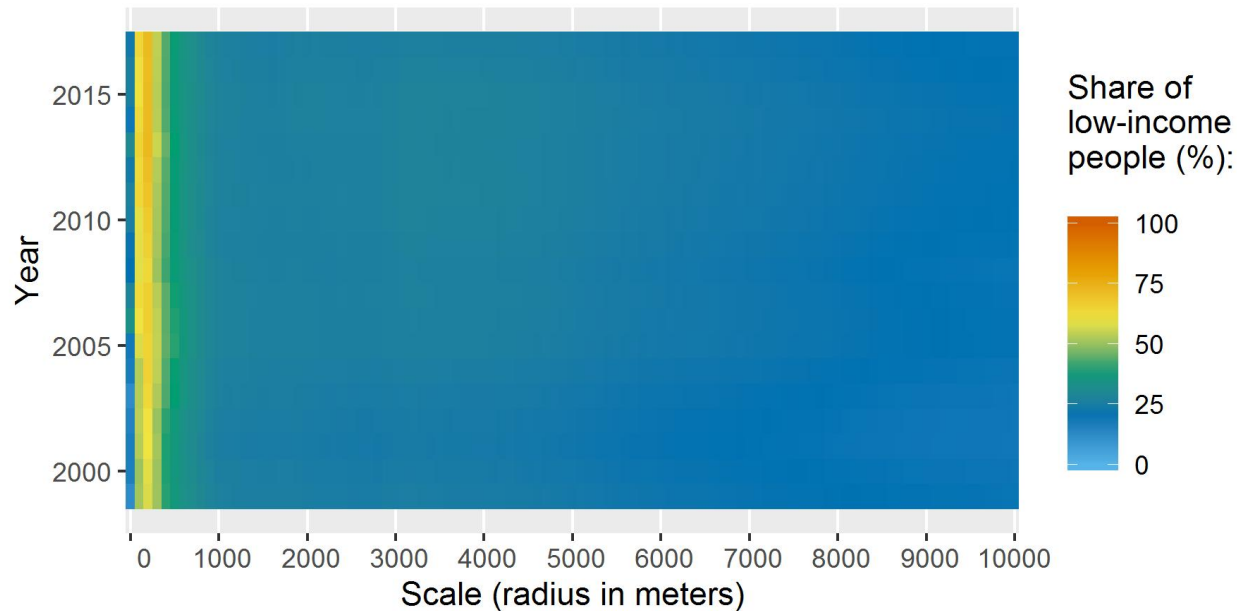
(see Petrović, van Ham, & Manley, 2018)

Exposure to spatial context at 101 scales

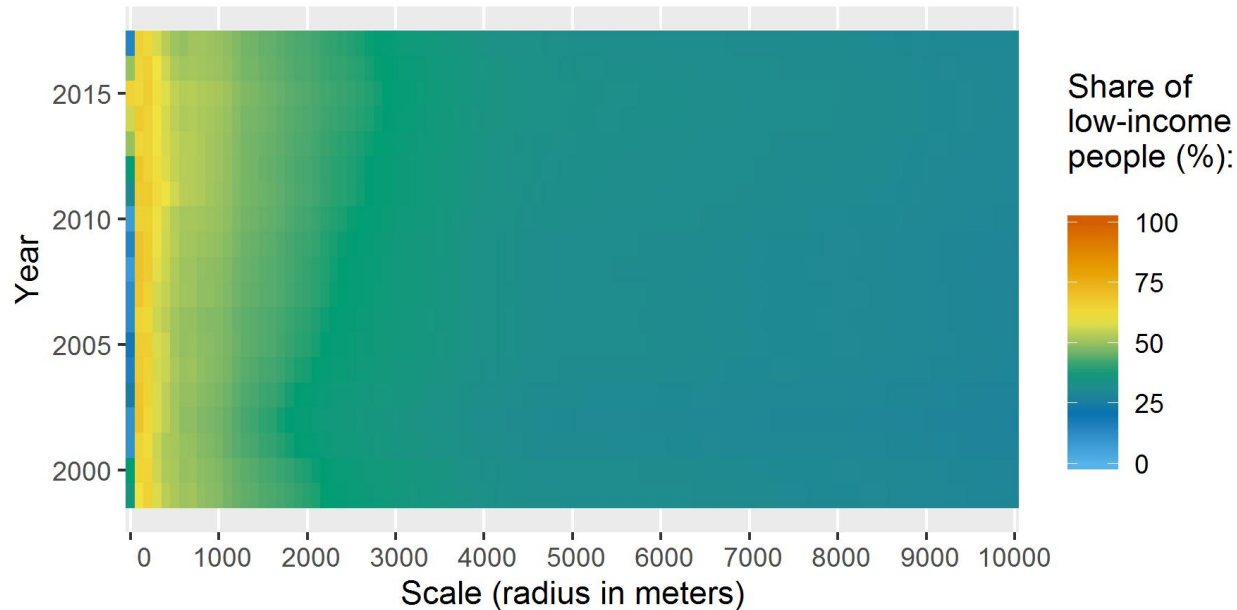


(see Petrović, van Ham, & Manley, 2018)

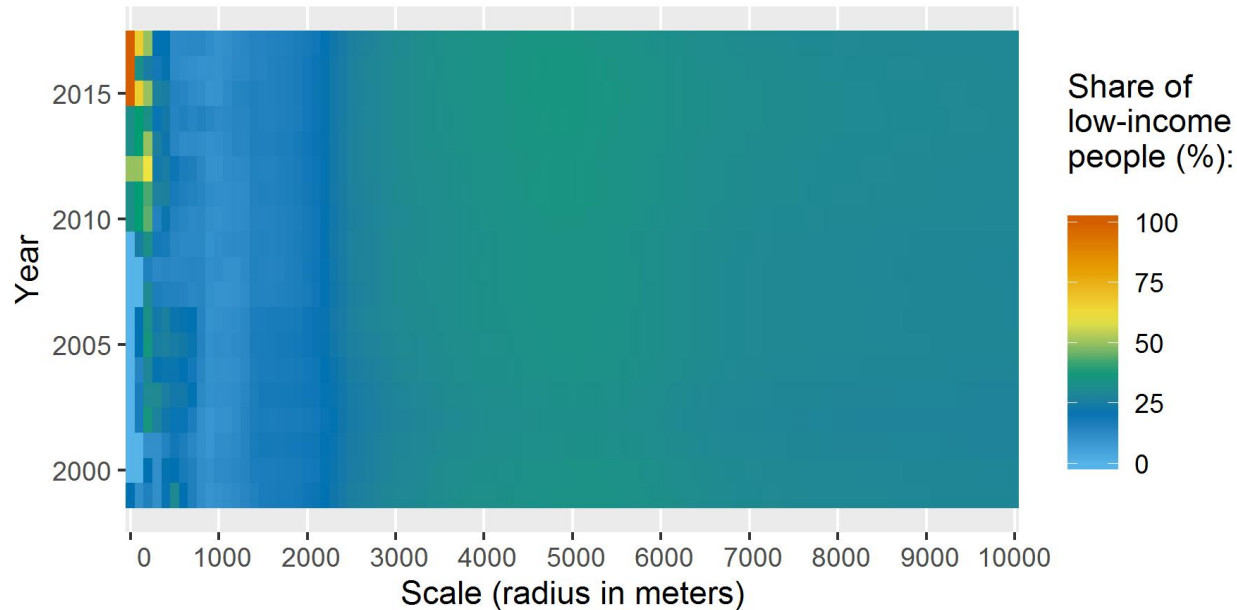
Share of low-income people in one residential location, measured at 101 scales in 19 years



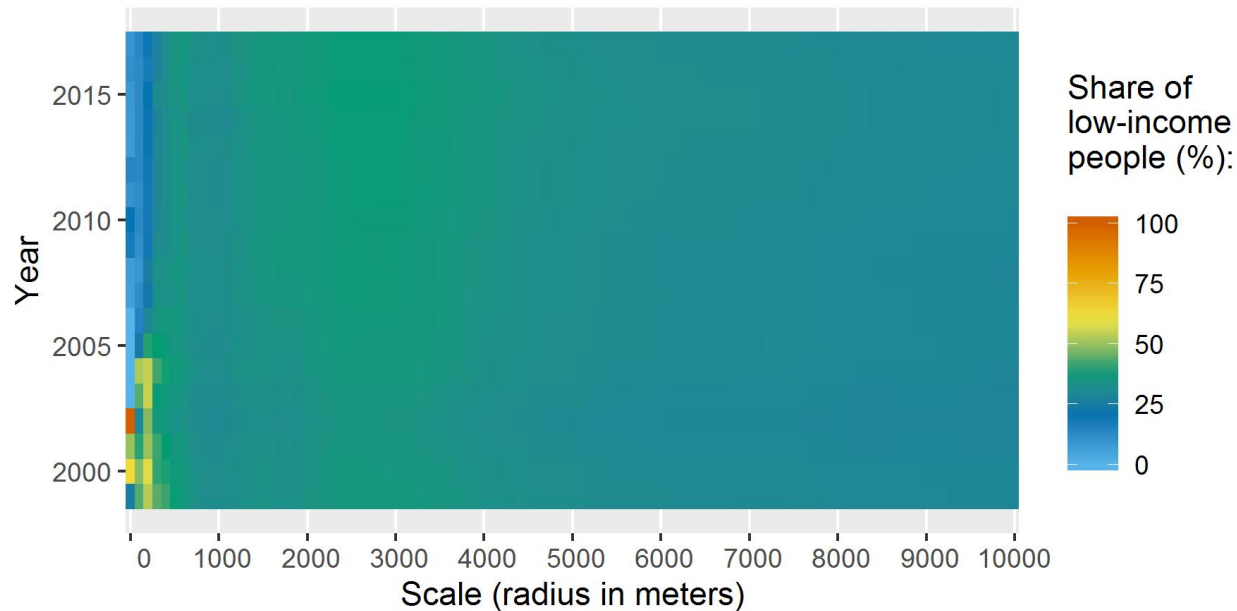
Share of low-income people in one residential location, measured at 101 scales in 19 years



Share of low-income people in one residential location, measured at 101 scales in 19 years



Share of low-income people in one residential location, measured at 101 scales in 19 years



Billions of data points

585,000 populated cells
× 101 scales × 2 variables
× 15 years = 1.8 billion
data points

→ 4 months continuous
calculations

Reduced computing time on ODISSEI Secure Supercomputer

585,000 populated cells
× 101 scales × 2 variables
× 15 years = 1.8 billion
data points

→ 4 months continuous
calculations

585,000 populated cells
× 101 scales × 3 variables
× 19 years = 3.4 billion
data points

→ 1 week on 24 nodes

Thank you!

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Recent publications:

Petrović, A., Manley, D., & van Ham, M. (2019). Freedom from the Tyranny of Neighbourhood: Rethinking Socio-Spatial Context Effects. *Progress in Human Geography*, Published online 28 August 2019 (open access).

Petrović, A., van Ham, M., & Manley, D. (2018). Multiscale Measures of Population: Within- and between-City Variation in Exposure to the Sociospatial Context. *Annals of the American Association of Geographers*, 108(4), 1057-1074 (open access).



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