



Planting seeds of change: a call to prioritize the greening of disadvantaged schools

Madeleine GUYOT, Hans VAN CALSTER, Harmony BRULEIN, Antoine LECAT and Sophie VANWAMBEKE

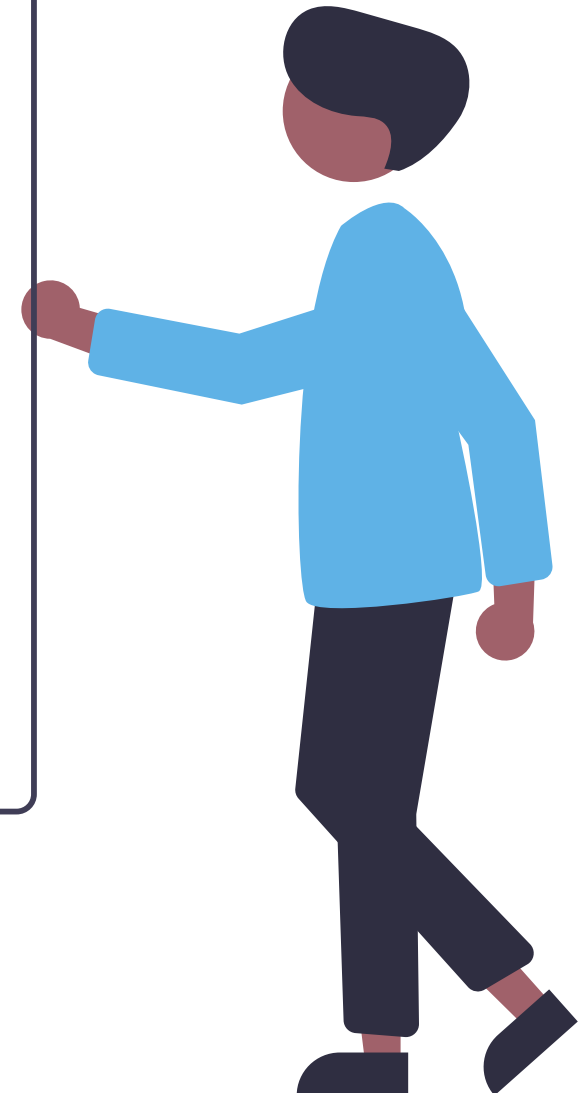
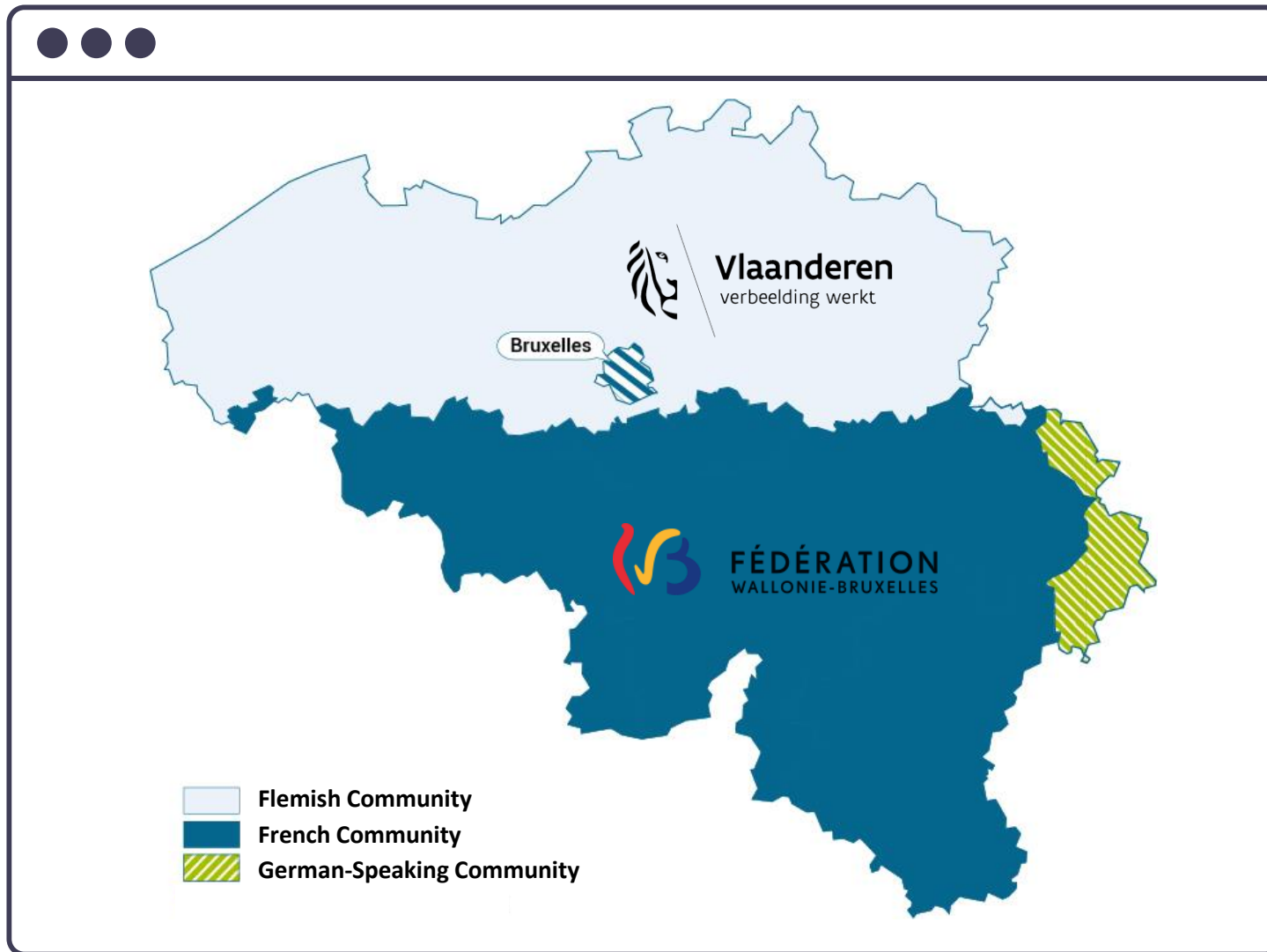
The natural way forward, Hasselt (Belgium), April 23 2024

Environmental Quality

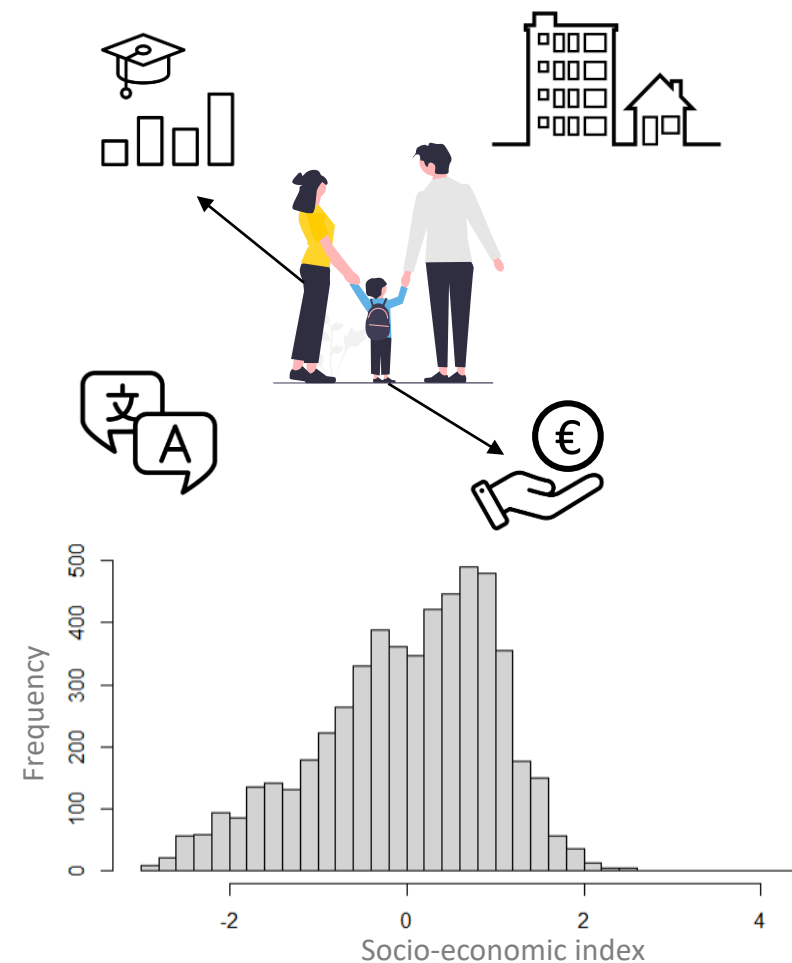
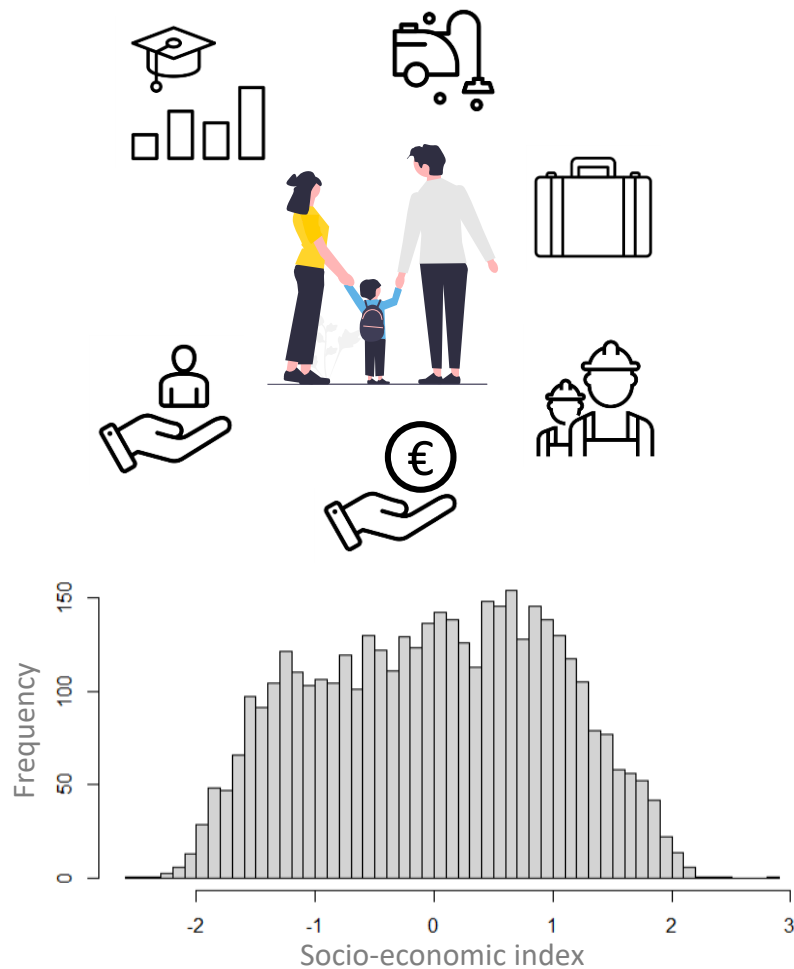


Inequality

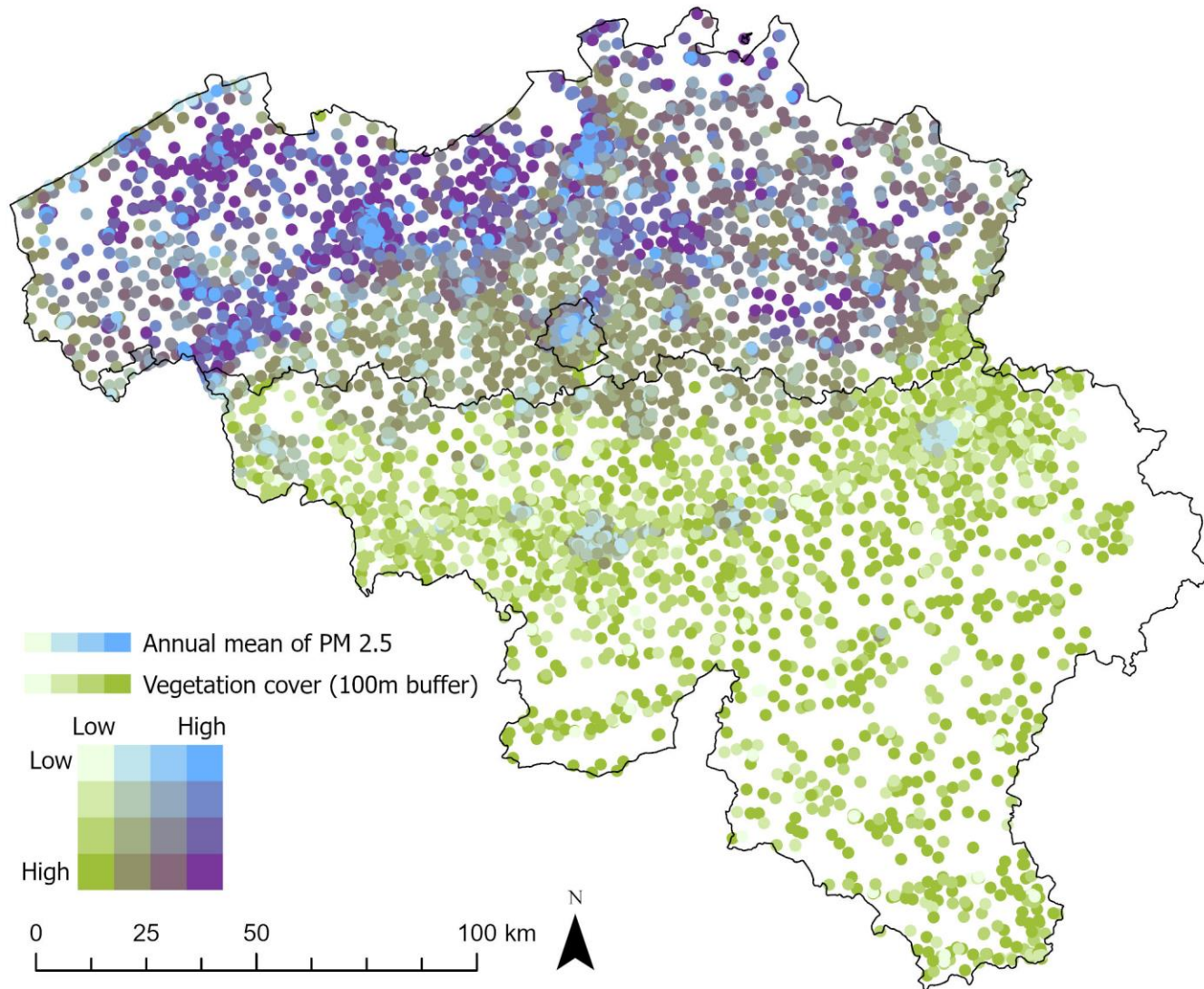




Socio-economic index (SEI) of school establishments



Environmental quality around schools



Green spaces

- Vegetation within a **100m** radius
- Vegetation within a **300m** radius
- Vegetation within a **500m** radius
- Vegetation within a **1000m** radius



Pollution

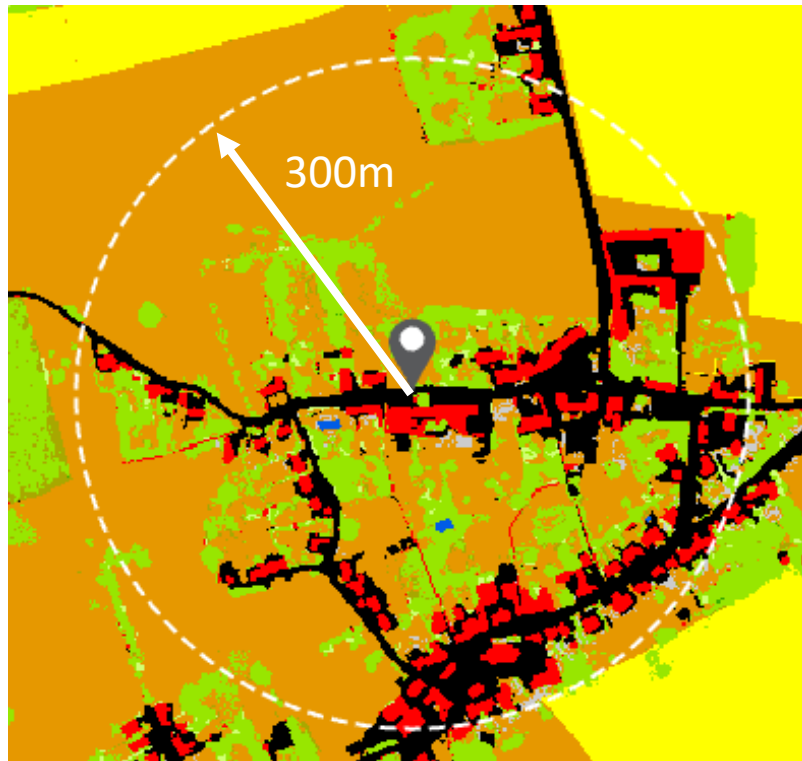
- **PM_{2.5}** : Particulate matter of <2,5µm
- **PM₁₀** : Particulate matter of <10 µm
- **Black carbon (BC)** : carbon fraction of particulate matter
- **NO₂** : nitrogen dioxide



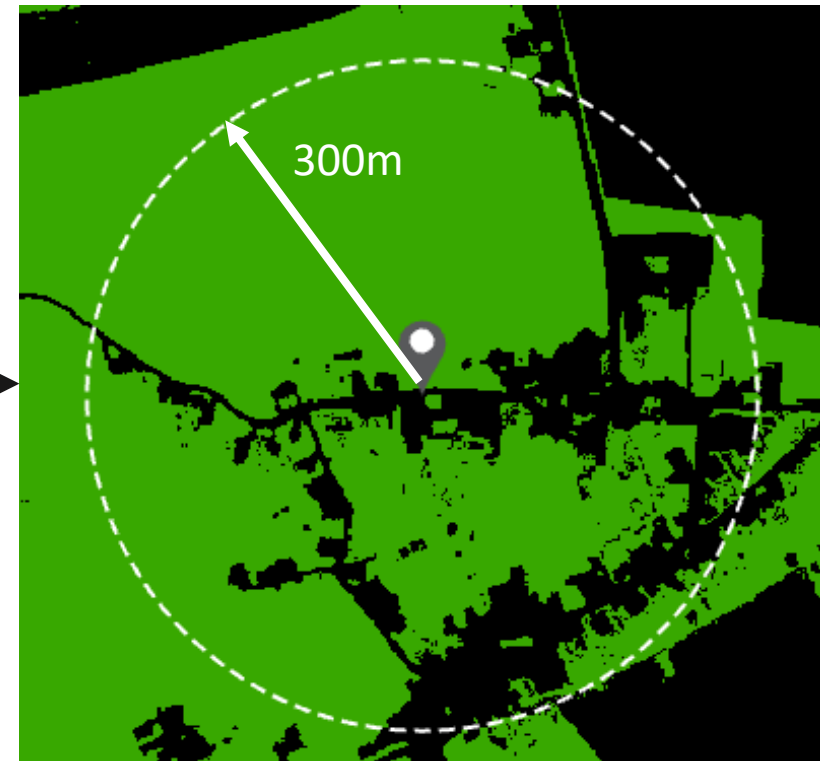
Green spaces

Land Cover Map 2m resolution

Source : LifeWatch 2015 Dataset (Radoux et al., 2023)



13 classes



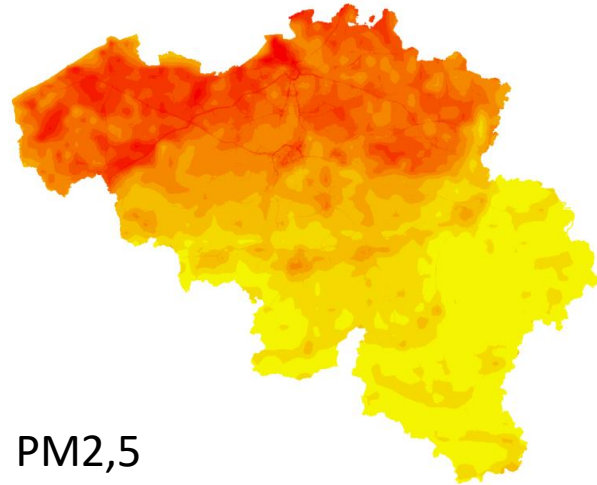
Green vs no green
76% vegetation cover



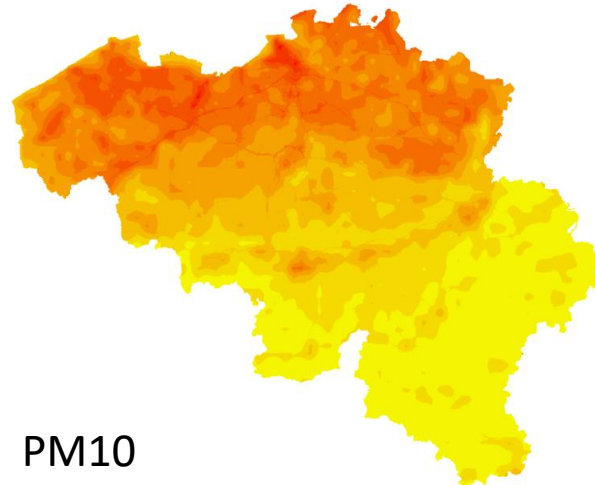
Pollution

10m-resolution models of air pollution levels

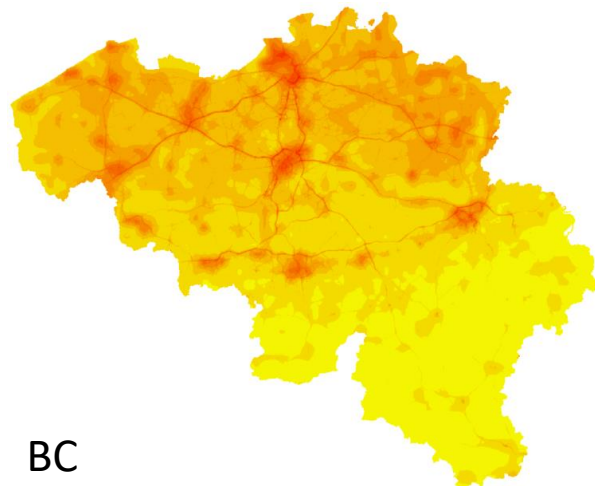
Source : Belgian Interregional Environment Agency (Lefebvre et al., 2013)



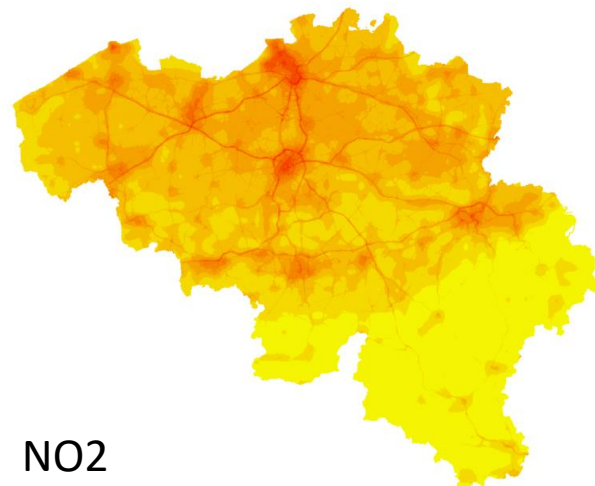
PM2,5



PM10

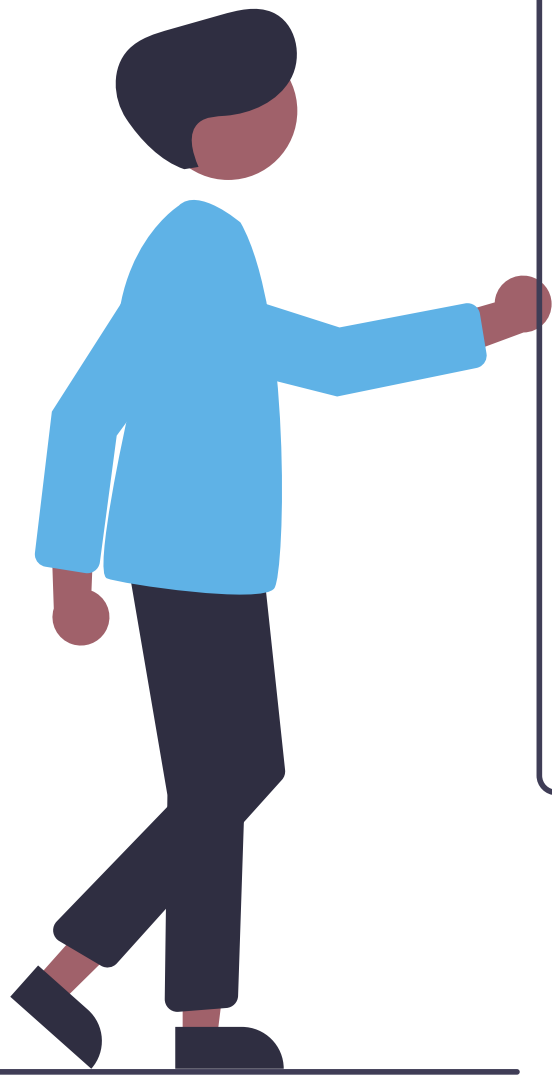


BC



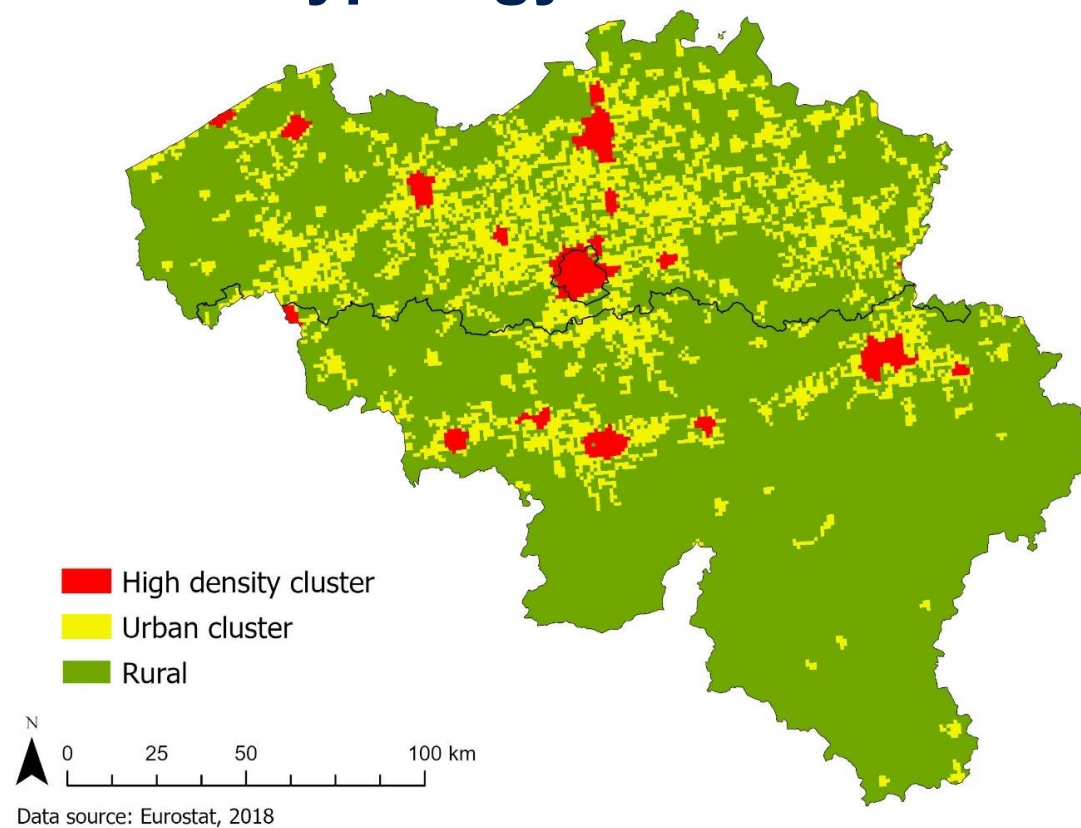
NO2

PM_{2.5} : Particulate matter of $<2,5\mu\text{m}$
PM₁₀ : Particulate matter of $<10\mu\text{m}$
Black carbon (BC) : carbon fraction of particulate matter
NO₂ : nitrogen dioxide



<https://ec.europa.eu/eurostat>

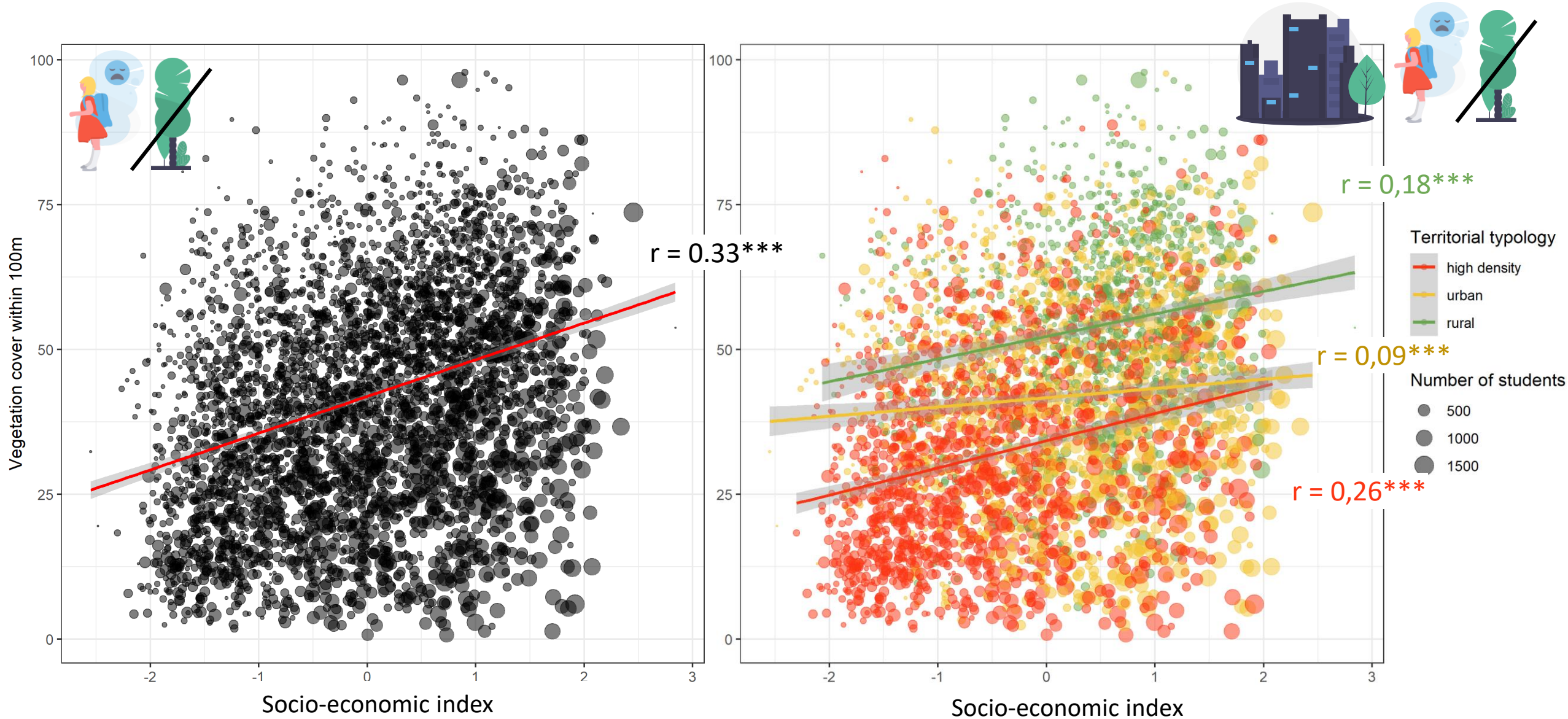
Territorial typology



Urban
or rural



Association between socio-economic index and environment

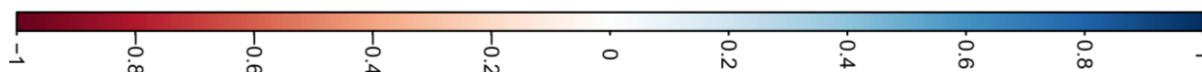


Association between socio-economic index and environment



N NO₂ PM_{2.5} BC PM₁₀ Vegetation 100m Vegetation 300m Vegetation 500m Vegetation 1000m Vegetation 2000m

All schools	4161									
Rural schools	1205									
Urban schools	1513	X	X		X				X	X
High density schools	1443	X	X							
Primary schools	2581									
Rural primary schools	951									
Urban primary schools	866	X	X		X					X
High density primary schools	764	X	X							
Secondary schools	679									
Rural secondary schools	92	X	X	X	X	X	X	X	X	X
Urban secondary schools	274	X	X	X	X	X	X	X	X	X
High density secondary schools	313		X							



Schools with **more vegetation cover** are associated with a **higher socio-economic index**.



Polluted schools are associated with a **low socio-economic index**.

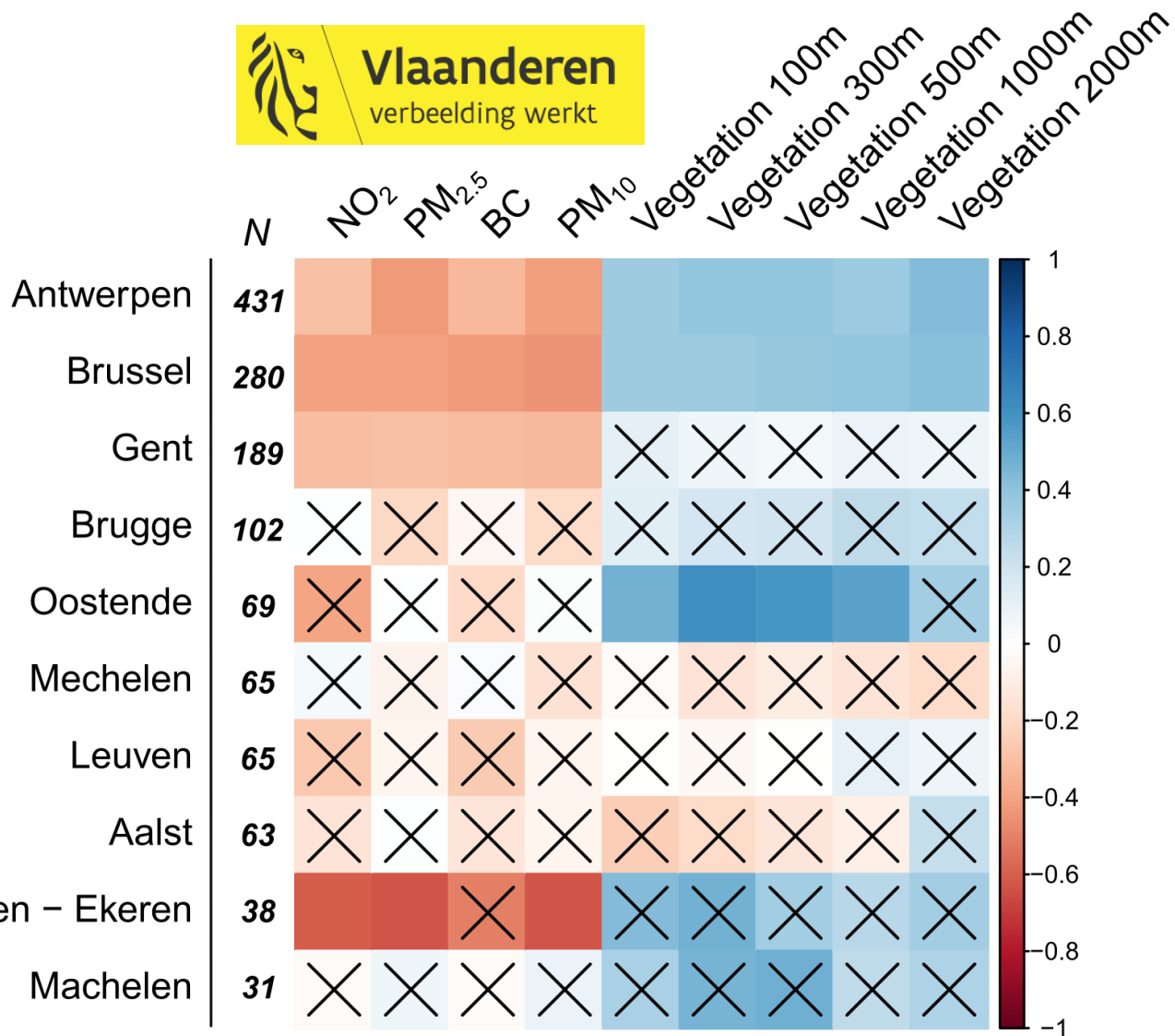


Polluted **rural schools** are associated with a **higher socio-economic index**



N NO₂ PM_{2.5} BC PM₁₀ Vegetation 100m Vegetation 300m Vegetation 500m Vegetation 1000m Vegetation 2000m

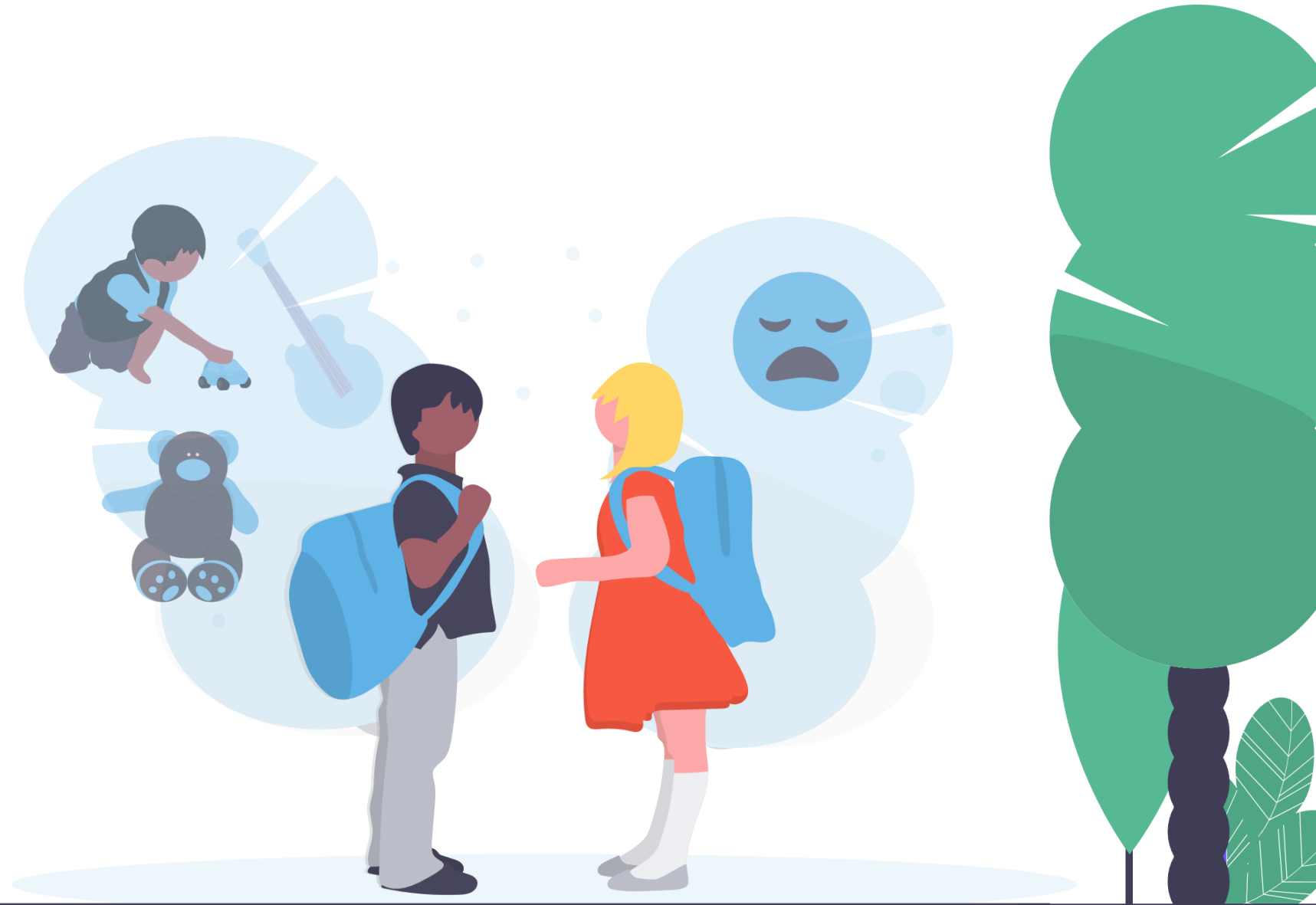
All schools	5485									
Rural schools	614	X	X	X	X	X	X	X	X	X
Urban schools	3558									
High density schools	1357		X							
Primary schools	2735									
Rural primary schools	403	X		X		X	X	X	X	
Urban primary schools	1701		X		X					
High density primary schools	631		X		X					
Secondary schools	2072									
Rural secondary schools	95	X	X	X	X	X	X	X	X	X
Urban secondary schools	1441		X				X	X	X	X
High density secondary schools	536		X		X			X	X	

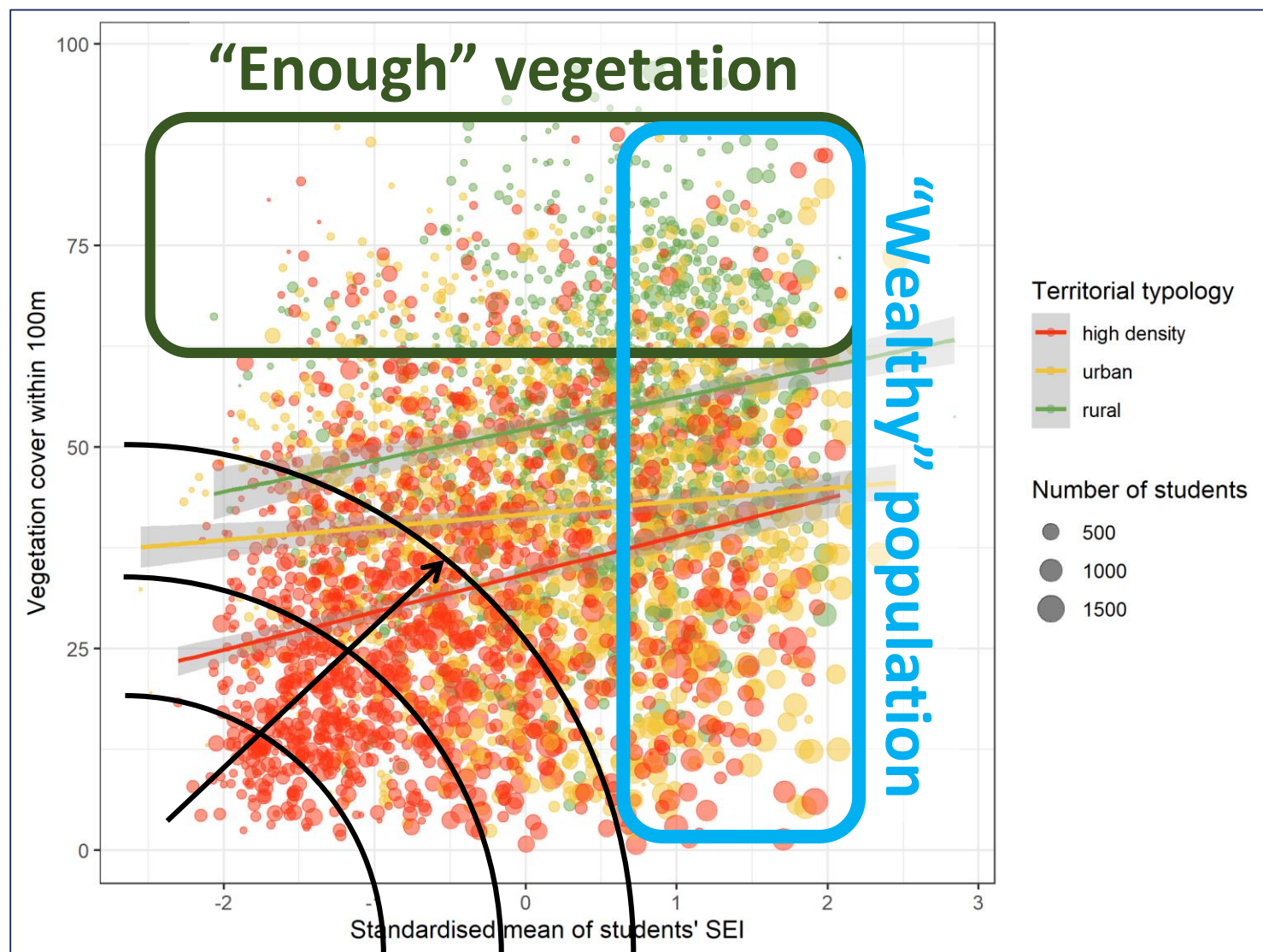


Quantitative Research Empowering Action-oriented Projects



Equigenic effect





Conclusion



Any questions?
Any comments?
Any suggestions?

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References

Lefebvre W, Van Poppel M, Maiheu B, Janssen S, Dons E, 2013, “Evaluation of the RIO-IFDM-street canyon model chain” *Atmospheric Environment* **77** 325–337

Radoux J, Bourdouxhe A, Coppée T, De Vroey M, Dufrêne M, Defourny P, 2023, “A Consistent Land Cover Map Time Series at 2 m Spatial Resolution—The LifeWatch 2006-2015-2018-2019 Dataset for Wallonia” *Data* **8**(1) 13

Image credits : unDraw