

Disentangling the link between built/non-built environment and mental health in Brussels

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Assessing the relations between built/non-built environment and mental health is complicated... because living environment of Brussels's citizens is strongly determined by socio-economic factors.

Our modern society is facing a growing population of individuals suffering from mental health disorders [1]. In Belgium, the proportion of respondents of the Health Interview Survey (HIS) presenting psychological difficulties increased from 25% to 32% between 2008 and 2013. Furthermore, they are more prevalent in the Brussels-Capital Region (40%) than in other regions [2]. Previous research has already highlighted the important role played by socio-economic factors in the onset of these pathologies [3]. However, the interaction with the urbanized environment remains poorly understood. Risk factors related to the physical environment of urban life (air pollution, street corridor effect, lack of green spaces etc.) can contribute negatively to mental health, e.g. by increasing stress [4]. The interdisciplinary research project NAMED intends to investigate the impact of the (non-) built environment on mental health in Brussels.

Methods

- Epidemiological study with **cross-sectional** approach
- Inhabitants of **Brussels** > 15 years of age
- Data from national health interview** surveys (2008 & 2013) coupled with **specifically developed indicators** describing the place of residence of each participant (n = 5032)
- Statistical analyses : correlation analysis, PCA, Kruskal-Wallis & Anova tests, multivariate logistic regression

Environmental indicators

- Vegetation coverage (1km & 600m buffer)
- Street vegetation coverage & visible street vegetation coverage
- Linear density of trees
- Canyon & street corridor effect
- Green view index (Google street view)
- O₃, NO₂, PM_{2.5}, PM₁₀, BC (annual mean µg/m³)

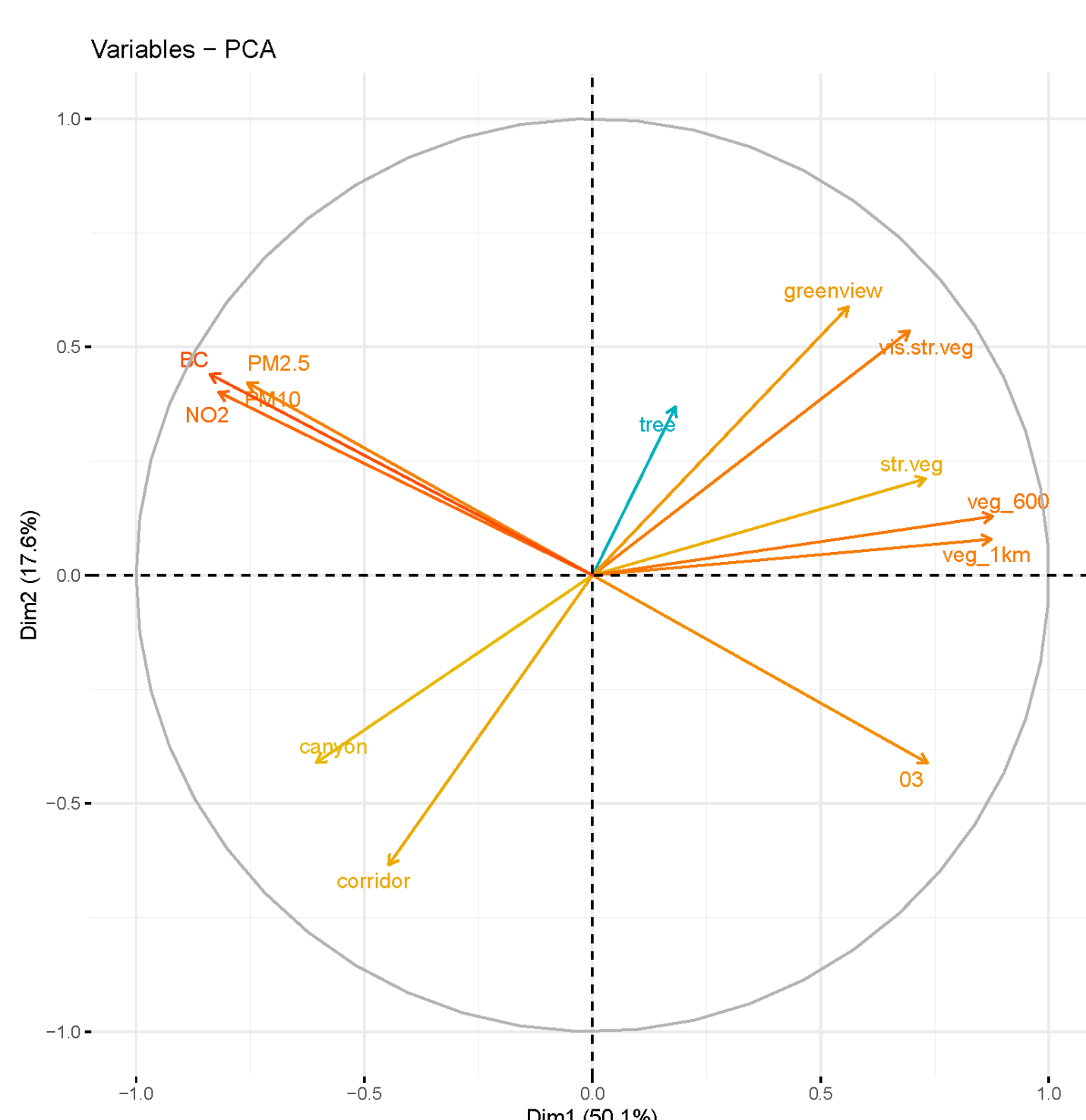
Mental health outcomes

- Anxiety, sleeping, depressive disorders (SCL-90-R)
- Energy level (SF36)
- Probable mental disorders (GHQ4)
- Subjective health (good to very good vs fair to very bad)
- reported depression and suicidal ideation in the past 12 months

Results

- All environmental indicators are significantly correlated

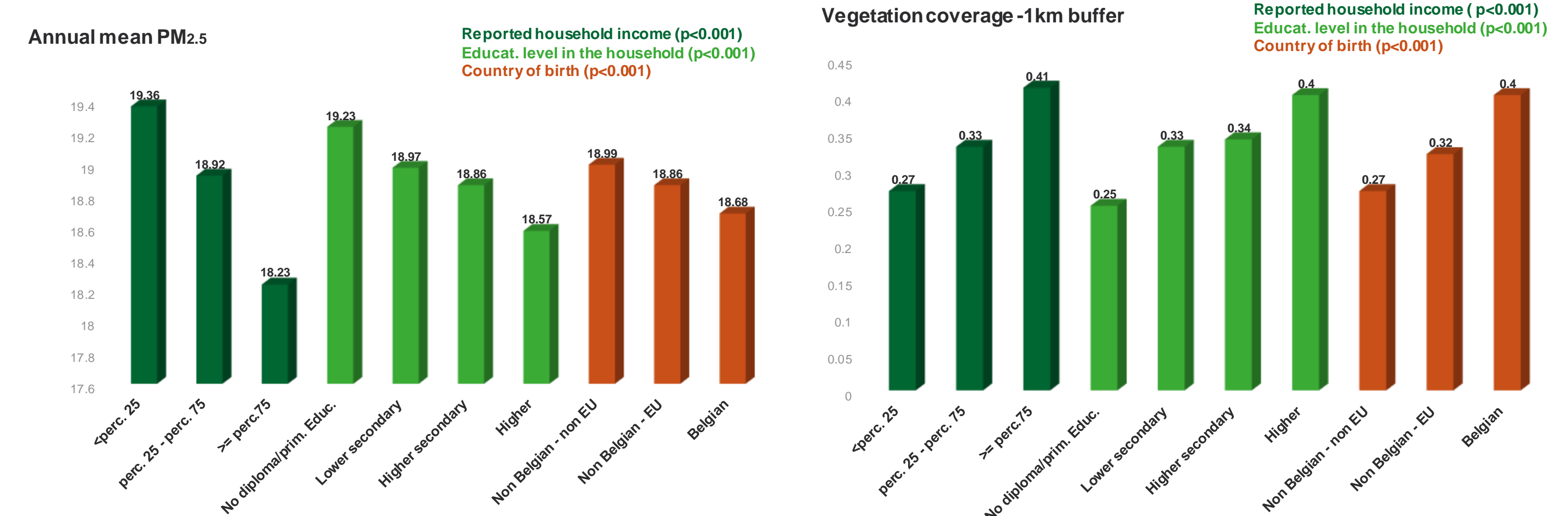
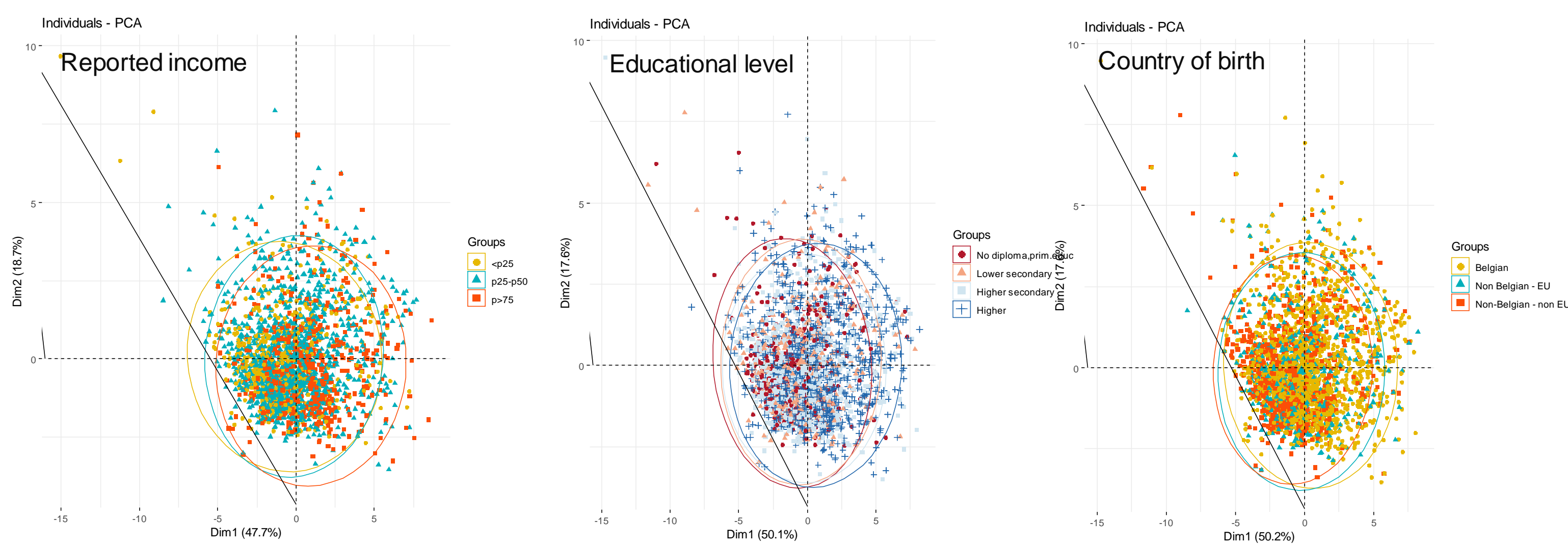
PCA: 68% of the variability explained by the 1st & 2nd dimension (n=4642)



The **1st dimension** represents the non built environment. It separates individuals living in green and less polluted areas from individuals living in highly polluted and less green areas.

The **2nd dimension** represents the built environment. It separates individuals exposed to a high street corridor effect from those living in streets with high visible green coverage.

- Confounding factors : significant relations between living environment and socio-economic factors



- For each environmental factor and mental health outcome, GLM adjusted for SE factors were performed. Results show:

- Significant relation between street corridor effect and poor subjective health even after adjusting for SE factors - OR: 1.36 (1.06-1.74).
- Significant relation between vegetation coverage (1km buffer) and depressive disorders - OR: 0.81 (0.70-0.95) but not longer significant after adjusting for SE factors.
- Significant relation between street vegetation coverage and anxiety disorders - OR: 0.86 (0.77-0.99) but not longer significant after adjusting for SE factors.

Discussion

- Highly correlated environmental factors on the one hand and environmental inequalities on the other make it difficult to disentangle the relation between the built/non built environment and mental health.
- Future work : separate analysis of the link between mental health and environmental factors for each socio-economic group.

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