



How do residents in the BCR perceive the quality of their living environment and what is the impact of this environment on their health?

Key messages

- 1** The quality of the living environment clearly has a negative (air pollution) or positive (public green spaces) impact on the health of residents within the BCR
- 2** To increase urban health, the exposure to air pollution should be avoided and the exposure to urban green should be stimulated, especially in socially vulnerable neighbourhoods
- 3** In the BCR, there is clearly a situation of environmental injustice: in socially vulnerable neighbourhoods, exposure to air pollution is higher and provision and quality of public green spaces is lower
- 4** To increase exposure to public green spaces, they should not only be (increasingly) available and accessible, but also (increasingly) attractive, both from a physical and a social point of view
- 5** To create attractive public green spaces, a bottom-up and interdisciplinary approach is needed

Introduction

Urban areas are growing fast worldwide and there is an increasing concern about the relations between urbanization, environmental threats, the quality of living spaces and human health. A healthy living environment is a prerequisite for good health. Research in environmental epidemiology clearly illustrates a direct health impact of environmental negatives such as air pollution and noise pollution and of environmental positives such as qualitative public green spaces.

This research project disentangles the interrelations between dimensions of environmental quality, social background factors and health and mortality in the Brussels Capital Region. It investigates the impact of social stratifiers – socioeconomic position, migrant background, age and gender – on the association between environmental quality and health and mortality and the perceptions that people have about the quality of their environment.

Methods, approaches and results

We use a mixed method and intersectionality approach, which are both rarely implemented in the field of environmental epidemiology. Intersectionality theory seeks to enhance understandings of social stratifiers by arguing that multiple marginalizations, such as those experienced by migrant women in lower social classes for instance, are mutually constituted and cannot be understood by approaches that treat social class, migrant and sex/gender distinctively. The quantitative research consisted of a statistical analysis of a dataset containing detailed individual information from the 2001 Belgian census linked to register data on mortality for the

follow-up period 2001-2014, and to objective environmental indicators assessed at the residential address of each individual. The qualitative research consisted of stakeholder interviews, in-depth interviews with Brussels civilians and concept mapping research.

Conclusions

Air pollution is harmful for health and increases the risk of premature mortality in the BCR and affects disproportionately socioeconomically deprived groups. However, ‘the public’ underestimates the probability and severity of its negative health impact.

In the BCR, living in areas with higher residential surrounding greenness and better perception of neighbourhood greenness is associated with better (self-perceived) health and reduced mortality rates (from natural causes – including Alzheimer’s disease and dementia, lung and breast cancer, cardiorespiratory diseases, and diabetes –, and from suicide). Despite environmental injustice in greenspace provision in Brussels, certain sociodemographic groups may benefit more from neighbourhood green spaces, specifically women and socioeconomically deprived individuals. Besides increasing the availability and accessibility of public green spaces (PGSs), it is also important to improve both the physical and social quality of the existing PGSs to expose the population to the beneficial effects of exposure to green.

Policy recommendations

1. Efforts to mitigate air pollution should be high on the policy agenda

Since the health impact of outdoor air pollution is a severe problem, efforts to mitigate air pollution should be high on the policy agenda. **Align policies with the recently updated WHO guidelines on air pollution levels**, based on emerging evidence on its harmful effects even at low levels. Efforts to mitigate air pollution are urgent for everyone but even more for the most **socioeconomically deprived neighbourhoods**. Therefore, policy measures to promote health should be formulated from a **proportionate universalism** approach, whereby universal policies are developed, but a greater emphasis is given to disadvantaged populations. Policies should therefore focus on improving the overall air quality within the BCR, but giving priority to socioeconomic inequalities in environmental exposures and health status of Brussels' residents (for instance, through housing policies providing affordable and healthy dwellings) **to avoid exacerbating health inequalities**.

2. Better inform and raise awareness about the exposure to and health risks related to outdoor air pollution

Air pollution has an ontological objective (harmful) existence. Nevertheless, **risk perceptions** about air pollution are diverse and mediate health in both a direct and an indirect way. An important determinant

of this risk perception is knowledge. The knowledge about (exposure to) air pollution and its potential negative impact for health is limited. **People tend to underestimate** both the probability and the severity of the harm resulting from **air pollution**. Therefore, it is important to **better inform and raise awareness about the exposure to and health risks related to outdoor air pollution**.

3. Create a green urban environment through on the one hand investments in the availability, the accessibility, but also the attractiveness of PGSs and on the other hand through investments in greening public space, especially in socially deprived neighbourhoods and during a COVID-19 like epidemic

In Brussels, there should be an **increase** in the **availability, accessibility, and quality of PGSs**, especially in socioeconomically deprived neighbourhoods. To make PGSs more attractive from a physical point of view, they should be **natural, non-spoiled and spacious**. Invest in **biodiversity**, the presence of **different and diverse natural elements** (fauna, flora, and water), **maintenance, 'greening' the direct environment of PGSs** (street green, natural materials, façade gardens...). Invest in cleaning of PGSs, sensitisation of civilians, penalisation for dumping litter and in structural solutions to exclude negative externalities such as air- and noise pollution. **Where possible, enlarge existing PGSs, create**

Policy recommendations

new ones or better connect the existing ones.

From a social point of view, they should be 'safe' and 'neutral'. Create a safe environment through the presence of 'park guard monitors' and neutral PGSs by attracting a diversity of social groups.

During the COVID-19 pandemic PGSs became increasingly important for a considerably big and diverse group of people and they might have partially counterbalanced the negative health outcomes resulting from imposed restrictions in order to fight the virus. Therefore, during COVID-like epidemics it is important to avoid restrictions related to the number of available PGSs, and to the use of available PGSs by restrictions that limit their accessibility and attractiveness. Moreover, it is important to increase the number of available, accessible and attractive PGSs, especially in neighbourhoods with a limited offer, and to create a societal structure that allows the population to use PGSs at different moments during the day/week to avoid congestion and increase individual use.

4. To create attractive PGSs, it is key to hand a bottom-up approach involving (potential) users and multiple stakeholders and professionals

Hand an interdisciplinary approach for the development and management of PGSs whereby the physical environment (focus on non-cultural ecosystem services) is viewed

in relation to the social environment. Hand a multilevel participative approach to make sure that the development and management of PGSs are embedded in the local social community, to make sure that they suit the needs of (potential) PGS-users and to create a feeling of ownership among them. In involving local populations, it is key to emphasise equity and inclusion.

5. Carefully assess the social impact of greening strategies on neighbourhoods and implement housing and social policies to combat green gentrification

Urban planners and policy makers should consider the distribution of different social strata in the population to maximize potential beneficial effects of greening strategies in cities. The health benefits of green spaces may be larger for women and socioeconomically deprived individuals. However, increasing greening infrastructure in cities has the potential to act as a driver of (green) gentrification, which could cause displacement and deteriorate the health status of most vulnerable urban dwellers, counteracting the beneficial effects on health of green spaces. We therefore advocate again for the need to implement greening strategies following proportionate universalism, targeting beforehand the structural social determinants of health, such as providing affordable housing, to avoid such an undesirable phenomenon.

List of publications

Published peer reviewed articles

Rodriguez-Loureiro, L., Casas, L., Bauwelinck, M., Lefebvre, W., Vanpoucke C., Gadeyne S. (2022). *Long-term exposure to residential greenness and neurodegenerative disease mortality among older adults: a 13-year follow-up cohort study.* Environmental Health 21, 49.

[Link](#)

Rodriguez-Loureiro, L., Casas, L., Bauwelinck, M., Lefebvre, W., Vanpoucke C., Gadeyne S. (2022). *Long-term exposure to objective and perceived residential greenness and diabetes mortality: a census-based cohort study.* Science of the Total Environment, 821, 153445.

[Link](#)

Noël, C., Rodriguez-Loureiro, L., Vanroelen, C., Gadeyne, S. (2021) *Perceived Health Impact and Usage of Public Green Spaces in Brussels' Metropolitan Area During the COVID-19 Epidemic.* Front. Sustain. Cities 3:668443.

[Link](#)

Noël, C., Landschoot, LV., Vanroelen, C., Gadeyne, S. (2021) *Social Barriers for the Use of Available and Accessible Public Green Spaces.* Front. Sustain. Cities 3:744766.

[Link](#)

Noël, C., Vanroelen, C., Gadeyne, S. (2021). *Qualitative research about public health risk perceptions on ambient air pollution. A review study.* SSM - Population Health, 15.

[Link](#)

Rodriguez-Loureiro, L., Casas L., Bauwelinck, M., Lefebvre, W., Vanpoucke C., Vanroelen C., Gadeyne S. (2021). *Social inequalities in the associations between urban green spaces, self-perceived health and mortality in Brussels: Results from a census-based cohort study.* Health & Place, 70.

[Link](#)

Manuscripts in progress

Kangas, T., Gadeyne, S., Lefebvre, W., Vanpoucke, C., Rodriguez-Loureiro, L. *Air pollution in Brussels in relation to cardiovascular and respiratory disease mortality – two standpoints: PM2.5 and subjective perception of air quality.* In progress. 2022.

Noël, C., Van Landschoot, L., Gadeyne, S., Vanroelen, C. *How does an attractive urban public green space look like in the mind of Brussels' urbanites?* In progress. 2022

List of publications

Noël, C., Van Landschoot, L., Gadeyne, S., Vanroelen, C. *Lay people's perceptions about air pollution, What's in a name?*. In progress. 2022

Mendoza, H., Rodriguez-Loureiro, L., Gadeyne, S., Bauwelinck, M., Lefebvre, W., Vanpoucke, C., Casas, L. *Residential surrounding greenness and suicide mortality in Belgium (2001-2011): a census-based longitudinal study*. In progress. 2022.

Rodriguez-Loureiro, L., Bauwelinck, M., Verdoodt, F., Lefebvre, W., Vanpoucke C., Casas, L., Gadeyne S. *Residential green spaces and site-specific cancer mortality in urban Belgium: a 13-year follow-up cohort study*. In progress. 2022.

Reports

Rapport Gieterijpark, Concept Mapping

[Link](#)

Rapport Park Ninoofsepoort, Concept Mapping

[Link](#)

Policy briefs

Policy brief: Environmental injustice in outdoor air pollution

[Link](#)

Policy brief: Gieterijpark, Concept Mapping

[Link](#)

Policy brief: Park Ninoofsepoort, Concept Mapping

[Link](#)

PhD's

PhD Lucia Rodriguez Loureiro: "Green spaces, social dimensions, and health & mortality"

PhD Charlotte Noël: "Environmental quality, perceptions and health in an urban context, a qualitative research approach"

About

The author & project

Lucia Rodriguez Loureiro: I am a social and environmental epidemiologist. My research interests are to explore the association between different characteristics of the living environment (air pollution, green spaces) and health and mortality in urban contexts. Besides, I am especially interested in understanding the role of individual and neighbourhoods' social dimensions in shaping environmental exposures and their health consequences. Within the Green&Quiet project, I managed the quantitative analyses.

E-mail:
lucia.rodriquez.loureiro@vub.be

Charlotte Noël: I am a sociologist and anthropologist. My research interests are to explore perceptions of people in different cultures, more especially environmental perceptions. I am experienced in qualitative research methods which I employed also within the Green&Quiet project.

E-mail:
charlotte.noel@vub.be

Prospective
research



Through the Prospective Research programme, the Brussels-Capital Region is hoping to fund research projects from a dual perspective: to provide a solid regional prospective vision; to build solutions to the specific challenges it will face in the years to come. The solutions proposed by the funded projects must take into account Brussels' urban complexity as well as the Region's environmental, social and economic transition objectives. The programme targets researchers in human science as much as researchers in exact or applied science.

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