

Nearby nature and human health: possible causal mechanisms and their implications

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Keywords: air quality, stress, physical activity.

1. Introduction.

Many people think of spending time in contact with nature as being good for their health. However, in the spatial planning of residential areas, the inclusion of green areas and elements to promote public health is not commonplace. There appear to be other, more pressing reasons leading to a preference for compact cities, densely populated, and with small amounts of greenery (Van den Berg et al, 2007). Why is the relationship between nature and health that so many of us assume exists, not more strongly reflected in health, spatial and nature policies? In this paper, we will look at the evidence base regarding the health effects of nearby nature in an urban context. The following two related questions will guide our evaluation:

- a. What exactly is the size of health benefits of having nearby nature in an urban context?
- b. What is the most efficient way to realise a health benefit of a certain size by making use of green space?

2. Background.

In the Netherlands, a relationship between the amount of nearby greenery and the perceived general health of residents has been observed (De Vries et al, 2003; Maas et al, 2006). The latter study showed that the proportion of people that reported having less than good health was about 1.5 times as high when only 10% of a 3-km circle around one's residence consisted of green space than when this was 90%. Such studies give a rough idea about the possible dose-response relationships but due to their correlational nature, they offer little insight into the mechanism behind the observed relation. Moreover, it is not even clear to what extent the amount of green space plays a causal role at all. Although composition effects dealing with the socio-economic status of the local population were statistically corrected to some degree, many alternative explanations remain possible.

3. Possible causal explanations.

The aforementioned studies were based on the premise that the amount of nearby nature would matter, because it would lead to more exposure to and/or contact with nature. The hypothesised importance of contact with nature was mainly based on theories and research on the restorative effects of such contacts (see e.g. Hartig et al,

2003). Ideas about which type(s) of nature would be (more) relevant, were not very clearly developed, so all types were included: agricultural land, forests and nature areas, as well as urban parks. Finally, the 3-km radius was chosen somewhat arbitrarily (we also experimented with a 1-km radius, with more or less similar results). For practical purposes, it seems desirable to have more precise ideas as to why nearby nature would have a beneficial effect on human health and wellbeing and which conditions it should satisfy. Based on the literature, several possible mechanisms were identified. These range from green space improving micro-climate, to local greenery facilitating contact between neighbourhood members. We will briefly introduce what we consider are three of the most likely mechanisms, including their evidence base, namely, improving air quality by catching fine dust, reducing stress and/or restoring attentional capacity, and stimulating physical activity. Furthermore, we will discuss the implications the three mechanisms are likely to have for the spatial planning of greenery in an urban context.

4. Discussion.

It seems difficult for policy makers and practitioners to exploit the beneficial effects of nearby nature for human health, because it is not clear yet how much nature and of what type is needed to bring about a specific health effect. Space is a scarce commodity in an urban setting, and trade-offs have to be made; in politics, size matters. It also remains to be seen whether “all the good of green” can be realised by one and the same layout and type of greenery. Our preliminary analysis suggests that different mechanisms require different green structures and types of vegetation, and have different additional requirements. For example, to reduce fine dust levels, having lines of coniferous trees in the vicinity of (but not too close to) busy roads might be a good idea. But such areas may not be conducive to stress reduction (traffic noise) or physical activity (still poor air quality), therefore, focusing on one of the more prominent mechanisms might be a good idea. However, the relative importance of the different mechanisms is unclear. Even the optimal green structure per mechanism is not always clear, for example, greening building facades by using climbers and creepers requires very little space, however, its effectiveness in reducing stress has not yet been established. Perhaps offering nearby green oases of peace and tranquillity would have a much stronger effect. In other words: how important is the quality of the nature experience for it to have a restorative effect? More generally, are we able to move beyond showing the existence of significant effects in experimental settings, significant differences in cross-sectional studies, and significant relations in correlational studies, to assessing the long-term effect of the sizes of specific local greenery configurations in real-life settings?

Key concluding points.

- Within the Netherlands a positive relation between the amount of nearby green space and human health does exist, but ...
- The extent to which the amount of green space plays a causal role in this relationship is still unclear, and may be limited.
- Three of the most likely mechanisms are: improving air quality, reducing stress and stimulating physical activity.

- As far as we can tell, the above mechanisms differ considerably in their spatial implications: optimal green structures and types of greenery differ.
- Research comparing different types of green space is scarce, even more so when it comes to long-term health effects in, for example, a residential setting.
- In future research, a more functional look at urban green space seems desirable: what works how well for whom, and for what reason?
- More specifically, mechanism-specific measures regarding the presence of the relevant type(s) of green space should be developed and tested.
- Alternative explanations should not be overlooked, but actively researched (population density and cultural diversity, emission of air pollutants).

References

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