CRDCN

Research Highlight

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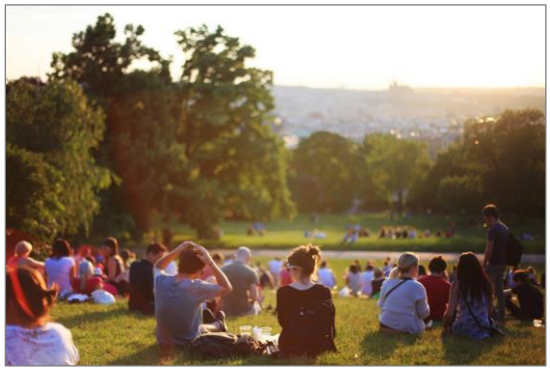
Living in Urban Canada: Do Nearby Green Spaces Make a Difference to Your Health?

In the span of 60 years, between the 1951 and 2011, the share of the Canadian population living in a rural environment fell by half. In 2011, 81% of the population lived in urban areas, compared to 62% in 1951. The impacts on health of being exposed to this population density and mode of living are very difficult to estimate due to the scale of the change, and relatively short time-frame under which these changes happened. Comparisons of outcomes between cities and between individuals within cities, however, can meaningfully inform us about the features of our new living situation that can predict negative outcomes.

One such feature is access, or lack thereof, to green spaces (e.g., parks, wood lots, public gardens). Green spaces offer a venue for social activities and exercise. They also provide some relief from poor air quality and heat island effects (localized hotspots created by the high absorption of solar radiation by cement and asphalt surfaces), and have been associated with cognitive, social, and psychological benefits.

What remains unclear, however, is whether these benefits translate into tangible health outcomes for those living near green spaces. Several studies examining the differences in places at a point in time have concluded that there is an association between health and nearby greenness. This article contributes further evidence of this pattern, adding in a time-dimension to show the long-term benefits that accrue to those living near green spaces. Using data from the Canadian Census Health and Environment Cohort (a linkage of the vital statistics mortality database, pollution concentrations, and the 2001 long-form census), the authors have measured the reduction in the probability of non-accidental death associated with exposure to greenness.

Greenness was measured by the Normalized Difference Vegetation Index (NDVI) and mapped onto the census geography using satellite images taken in the summer from 2002 to 2011. The mortality reductions associated with living near green spaces were then estimated, taking into account other personal and contextual covariates such as income, education, gender, unemployment rates, share of low income, population density, and pollution levels.



About this *CRDCN Research Highlight*

This *Research Highlight* draws on Dan L. Crouse and al., "Urban Greenness and Mortality in Canada's Largest Cities: A National Cohort Study," *Planetary Health*, vol. 1, October 2017.

It was prepared in collaboration with the authors by Grant Gibson, Assistant Director of Research at the Canadian Research Data Centre Network (CRDCN), a major scientific infrastructure created to improve access to Statistics Canada's confidential microdata, expand the pool of skilled quantitative researchers and support evidence-based policies through knowledge transfer activities.

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Results

- Green space was associated with reduced mortality for all non-accidental death once the covariates and pollution levels were included as controls.
- The strength of this effect was highest for respiratory-related death, and lowest for cerebrovascular death.
- On average, moving from a low-greenness area (25th percentile) to a high-greenness (75th percentile) was associated with reduced mortality risk by about 10%.
- Protective effects were strongest for those aged between 35 and 75, those with high income, those who were married, those with high education, and men.
- The foremost limitation of this study is the inability to distinguish between the types of green-spaces; these may differ between neighbourhoods and explain the additional protective effects for those with high income and education. For example, a wooded park may be a higher quality green space than an unmaintained lot, and may be more likely to appear in a high income neighbourhood, but NDVI cannot differentiate between the two types of greenspace.
- The relationship between green space and the mortality reduction is non-linear. Areas with no green space would benefit the most from having some green-space, while those with lots of green space would not benefit as much from adding the same amount of green space.

Policy and research implications

- Urban and city planners should recognize the benefits of green spaces for human health and incorporate it into their thinking about city designs.
- Green space distribution is important: The benefits accruing to the citizens living in a city with many small parks are greater than that of citizens living in a city where one big green space of the same size is available.
- Understanding the mechanisms underlying these results will be important in harnessing the health benefits of green spaces. There may be ways to recreate these effects at lower cost using accessible green roofs if proximity to nature is what provides the health benefit. Alternatively, if physical activity and space is what is providing the benefit, parks and open spaces may be the only way to realize the health benefits.