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# Green Cities Provide Demonstrable Health Benefits

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**Several recent studies offer strong evidence of positive health effects of green cities for babies, kids, and adults.**



Contributor:

**Steve Hansen**  
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Currently, half the world's population lives in cities, a number expected to top 60 per cent by 2050. Creating cities with healthy green spaces could presumably improve citizens' health and lower health care costs.

One study, Residential Greenness and Birth Outcomes: Evaluating the Influence of Spatially Correlated Built-Environment Factors, looked at birth outcomes for 64,705 births in Vancouver, B.C., Canada.

"We aimed to investigate associations between residential greenness and birth outcomes and evaluate the influence of spatially correlated built environment factors on these associations," the study's authors said.

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The greenness of the participants' neighbourhoods was evaluated using the Normalized Difference Vegetation Index (NDVI), which uses satellite data to determine tree cover and then assigns a value from -1 to +1; the higher the score, the more tree cover. Study researchers then correlated that data with the pregnant mothers' addresses and estimated "exposure to residential greenness, air pollution, noise, neighborhood walkability, and distance to parks."

Results showed that **very premature births were 20 per cent lower for mothers living in greener areas, and moderately premature births were 13 per cent lower. Babies deemed small for gestational age were fewer, with babies from greener areas weighing 45 grams more.**

The researchers from Oregon State University in the US, Utrecht University in the Netherlands, and the University of British Columbia noted that the findings held when other factors were considered, such as walkability, exposure to air and noise pollution, distance to the nearest park, and socioeconomic status. The study was published in the journal [Environmental Health Perspectives](#).

### Green space and mental health

Another study looked into the effects of green space on mental health. That study, *Exposure to Neighborhood Green Space and Mental Health: Evidence from the Survey of the Health of Wisconsin*, concluded that **"Higher levels of neighborhood green space were associated with significantly lower levels of symptomology for depression, anxiety and stress,** after controlling for a wide range of confounding factors."

This study used the population-based Survey of the Health of Wisconsin database and included people from a range of environments, from urban to rural.

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One interesting supposition is the idea that natural environments can help people manage their stress response to their environment. Modern urban environments give us tasks that demand “directed attention,” or tasks that we wouldn’t necessarily choose to focus on but must nonetheless. Attention Restoration Theory says directed attention leads to mental fatigue, but natural environments engage “fascination attention,” an involuntary type of attention that helps to restore the brain.

According to the study, experimental work in the field of environmental psychology has “empirically linked nature exposure with attention restoration and stress reduction.” The study was published in the International Journal of [Environmental Research and Public Health](#).

### **Children’s health**

Another study, titled *A cross-sectional analysis of the effects of residential greenness on blood pressure in 10-year old children: results from the GINIplus and LISIplus studies*, concluded that “Lower residential greenness was positively associated with higher BP in 10 year-old children living in an urbanised area.”

However, the authors also state flatly that further studies are required, which must include participants of varying ages, geographical areas, and urbanisation levels.

The researchers used the Normalized Difference Vegetation Index (NDVI) to evaluate the residential greenness of the neighbourhoods of 2,078 10-year-old German children. They note that Dr. Roger Ulrich’s psychoevolutionary theory claims that natural environments control stress by reducing blood pressure and muscle tension. This observational study supports Ulrich’s theory, the authors state. The study was published in the International

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Journal of [Environmental Research and Public Health](#).

### **What are the factors that lead to these improved health outcomes?**

Some researchers are attempting to define those more completely. Dr. Timothy Beatley is a Professor of Sustainable Communities in the Department of Urban and Environmental Planning at the University of Virginia. He's part of the [Biophilic Cities Project](#), based at the University of Virginia's School of Architecture.

Beatley says a biophilic city "is a city which successfully integrates nature into the urban landscape, from trees and parks, to vertical gardens and green rooftops."

The concept was popularized by famed Harvard biologist and entomologist E.O. Wilson, who defined biophilia as "the innately emotional affiliation of human beings to other living organisms."

Beatley's work poses important questions, namely "What is the minimum daily requirement of nature?" and how to deliver it to cities, as well as "What urban tools, techniques and strategies will be most effective at ensuring this nature exists in our urban future?"

Some solid data already exists for the health benefits of urban trees and walkable cities. According to the National Arbor Day Foundation and the US Forest Service:

- A tree planted on the west side of a home will lower energy bills by about 12 per cent after 15 years of growth.
- A tree can generate as much cooling effect as 10 room-size air conditioners operating 20 hours per day.
- An acre of forest absorbs more than 5 tons of carbon dioxide and produces more than three tons of oxygen per year.

- One study measured particulate reduction of nine to 13 per cent in stands of trees, while stands of trees reduced the amount of dust reaching the ground by 27 to 42 per cent compared to open areas.

**Walkability** has also been well studied. Walk Score analyzes cities for walkability; according to their research, residents of walkable neighborhoods, on average, weigh 2.7 to 4.5 kilograms less than residents of sprawling neighborhoods. Walking also offers benefits against diabetes, cancer, arthritis, high blood pressure, and heart disease.

A Harvard study also showed some of the benefits of walking. Study author and post-doctorate research fellow, Qibin Qi, Ph.D, at the Harvard School of Public Health, said a brisk daily walk of one hour reduced the genetic influence toward obesity by half, as measured by differences in body mass index. Conversely, a sedentary lifestyle of watching four hours of television per day increased the genetic influence toward obesity by 50 per cent. The study included 7,740 women and 4,564 men.

Worldwide, some of the healthiest cities are also the most walkable. Copenhagen, New York City and Hong Kong all top “healthy cities” lists, and all are highly walkable, thanks partly to high density development and partly to policies that promote walking and biking.

Copenhagen has successfully replaced a driving culture with a biking and walking culture. One study pegged pedestrian activity in Copenhagen’s city centre at 80 per cent of traffic, while bicycles account for 36 per cent of all work trips.

Hong Kong’s residents enjoy long life expectancy, at 82.5 years, low infant mortality, and according to LSE Cities, about 45 per cent of trips in the city are made on foot.

New York City has projects underway aimed at increasing the urban forest and creating new bike lanes. The Million TreesNYC program intends to increase the size of the urban forest over a decade, with 70 per cent of trees planted on public lands over a decade. The city has also installed about 50 kilometres of protected bike lanes on city streets in the last seven years, with the goal of installing another eight km yearly.

In Australia, Sydney's Walk Score of 63 qualifies as "moderately walkable." However, the city has invested in bike infrastructure which has resulted in bike trips tripling in peak periods. A project to plant 20,000 new street trees will bump up the urban forest by 50 per cent by 2030.

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Steve's background includes nearly two decades in corporate marketing and communications, freelance journalism, and landscape design....

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**Corey H. says:**

January 13, 2015 at 3:08 am

In spite of its walkability I'm shocked that Hong Kong is considered one of the world's top healthiest cities – its population density is stifling and its air pollution horrendous because of its proximity to China's biggest manufacturing hub.



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