Green Cities :: Good Health
Research and Practical Applications

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gbe - Green Building Exhibition
2018: The Wellness and Health Edition
27 October 2018
University of Texas Medical School, Austin
SITES Landscape Architect, Heather Venhaus
stormwater management
human health & well being
patient & medical staff interactions
patient & medical staff interactions
Milan, Italy :: Vertical Forest
800 trees!

Stefano Boeri Architetti
concept :: Forest City, Shijazhuang China
New York City
Central Park

Photo by: IndPol06
Los Angeles California
Miami
Santo Domingo
WHO Health Definition

A state of complete physical, mental, and social well-being and not merely the absence of disease or infirmity (1946)
Social Determinants

- General socio-economic, cultural and environmental conditions
- Living and working conditions
- Unemployment
- Water sanitation
- Health care services
- Housing
- Agriculture and food production
- Education
- Work environment
- Individual lifestyle factors
- Age, sex & hereditary factors
Metro Nature & Human Health

Nearby nature includes a variety of spaces and places:

- Urban Forest Canopy
- Biophilic Design
- Parks and Gardens
- Green Stormwater Infrastructure
Green Cities: Good Health
www.greenhealth.washington.edu

Sponsors:
USDA Forest Service,
(U&CF Program + Pacific NW Research)
University of Washington
NGO partners

Thanks!
to U of WA students:
Katrina Flora
Mary Ann Rozance
Sarah Krueger

Research Reviews & Summaries
Local Economics

Trees in cities are not grown and managed for products that can be bought and sold on markets, but they do provide many intangible services and functions. This article serves two purposes. First, it introduces valuation methods that are used to convert intangible benefits to dollar sums. Then, it shows how nonmarket valuations can support local decision-making.

Fast Facts

- The presence of larger trees in yards and as street trees can add from 3% to 15% to home values throughout neighborhoods.
- Averaging the market effect of street trees on all house values across Portland, Oregon yields a total value of $1.35 billion, potentially increasing annual property tax revenues by $15.3 million.
- A study found 7% higher rental rates for commercial offices having high quality landscapes.
- Shoppers claim that they will spend 9% to 12% more for goods and services in central business districts having high quality tree canopy.
- Shoppers indicate that they will travel greater distance and a longer time to visit a district having high quality trees, and spend more time there once they arrive.
design: milepost

co-author:  

co-author & printing: The Nature Conservancy
Story: Human Health Benefits Across the Life Cycle
Urban Forests and Newborns

the natural environment may affect pregnancy outcomes . . .

10% increase in tree-canopy cover within 50m of a house

= lower number of low weight births

(1.42 per 1000 births)

Donovan et al., Health & Place 2011;
Hystad et al., Env Health Perspectives 2014
ADHD and nature contact

- 17 children aged 7-12 with diagnosed ADHD
- 20-minute guided walks
  - Park
  - Neighborhood
  - Downtown
- Pre-walk puzzles
- Post-walk cognitive test

Faber Taylor & Kuo. 2009. *Journal of Attention Disorders*
Fiddleheads Forest School
Washington Park Arboretum (Seattle)
cognitive
social &
physical
learning
Hygiene Hypothesis

- presence of soil bacteria in body, *Mycobacterium vaccae* = increased serotonin
- boost immune function
- may alleviate depression (dirt or Prozac?)

Lowry et al. 2007. Neuroscience
CDC moderate activity recommendations

parks, active living, active transit
Walking Programs

children
elders
families
Parks Prescription

Date: ____________________________
Dr: ____________________________
Name: __________________________
I recommend:
☐ Walking
☐ Other: ________________________
_______________________________ minutes a day
_______________________________ days per week

* Health Canada suggests moderate activity of 30 minutes per day | 5 days a week

**Benefits of daily activity**
- Improve overall physical and mental health
- Maintain a healthy weight
- Reduce the risk of diabetes and other chronic conditions
- Lower cholesterol levels
- Manage stress and anxiety

Signature: ________________________
Parks Prescription

1. Visit www.REACHforbetterhealth.com
2. Enter your zip code
3. Click
4. Exercise in the park and share outcomes with your healthcare provider.

Get a prescription for ParksRx from your healthcare provider.

PARKS Rx
Your Prescription For Better Health

This information is provided for educational purposes and is not to be considered medical advice.

www.REACHforbetterhealth.com/ParksRx
Made possible with funding from the Centers for Disease Control and Prevention.
Shinrin yoku (forest bathing)

- extensive research
- restorative experiences
- workers retirees
- networked system, 52 bases in Japan
The medicine of being in the forest

We are the leading global voice for forest bathing and forest therapy

Santa Rosa, California
Green Streets for Walkability

evidence of lower frustration and higher meditation when moving into the greener streets

Improving Depression

20 adults with major depression walk in a park setting and a built setting

- 50-minute walks one week apart
- before-after testing:
  - Mood: Positive and Negative Affect (PANAS)
  - Cognition: Backward Digit Span (BDS)

Berman et al. 2012. *Journal of Affective Disorders*

cognitive and affective improvements after walking in a nature setting
Experience the restorative powers of nature and join us for Strolls for Well-Being, a free 10-week program offered at Bloedel Reserve. If not already a member, participants are given a temporary membership to

DAY-USE STROLLS:
Since introducing the Strolls for Well-Being program in 2014, hundreds of people have benefited from the healing effects of nature.
SYSTEMS THINKING

- Air Quality
- Stormwater
- Waste Water
- Solid Waste
- Cultural Heritage
- Biota
- Exercise & Fitness
- Active Mobility
- Noise
- Connectvity
- Public Art
- BMP’s
- Carbon
- Allergens
- Energy
- Community Identity
- Social Capital
- Heat Island
- Waste Water
- Connectivity
- Cultural Heritage

credit: American Planning Association
Green Infrastructure

systems solutions
ecology that works
complexity & diversity
co-design for co-benefits
Grey Infrastructure

Green Infrastructure

Drain, direct, dispatch

Slow, spread, soak

Source: Low Impact Development: A Design Manual for Urban Areas, 2010
stormwater retention
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green infrastructure tools & strategies = mini parks?

credit: Seattle Public Utilities
green infrastructure & reduced crime

Philadelphia

reduction in narcotics arrests (18–27 %) for green not gray

vs. 65% increase across city

Kondo et al. 2015.
Journal of Public Health
Stormwater Management

Thornton Creek Water Quality Channel (Seattle, SvR Design)
1 hectare, treats runoff from 275 hectares (1 hectare = 2.47 acres)
Tanner Springs Park
Portland OR
linked to active living network
neighborhood social cohesion

environmental education & social learning
Historic 4th Ward Park - Master Plan
August 2009

[Map Image]

[ aerial view of park area]
Clear Creek Basin, 2 acre stormwater detention lake, 17 acres of greenspace & parks amenities
2009: Two levels of unused parking lots

2012: Two bioinfiltration basins with walking path
Summer 2011, One year after installation.
Nature for Health
Knowledge to Practice

• nearly 40 years of research:
  nearby nature, human wellness
• critical mass of evidence – now what?
• integrate greening and health programming
• urban systems co-design for co-benefits