How Trees (and Green Spaces) Improve Our Health and Quality of Life

Kathleen Wolf, Ph.D.
Research Social Scientist
University of Washington (Seattle)
School of Environmental and Forest Sciences

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stormwater retention
How can we transform the roof?

How can we transform the walls?

How can we transform the ground?

retention
filtration
storage
infiltration
treatment
biodiversity
evapotranspiration
SYSTEMS THINKING

- AIR QUALITY
- STORMWATER
- ENERGY
- COMMUNITY
- IDENTITY
- SOCIAL
- CAPITAL
- ACTIVE
- MOBILITY
- NOISE
- EXERCISE & FITNESS
- BIOTA
- BMP'S
- CARBON
- PUBLIC ART
- CULTURAL
- HERITAGE
- CONNECTIVITY
- WASTE WATER
- SOLID WASTE
- HEAT ISLAND
- ALLERGENS

credit: American Planning Association
Health Definition

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

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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 $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.
Outside Our Doors
The benefits of cities where people and nature thrive.

design: milepost

coa-author: Forest Service

coa-author & printing: The Nature Conservancy
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
Trees & Physical Activity

• school children in cities grades 6 to 8
• relationship of tree cover to outside-of-school physical activity
• 5% increase in treed area cover = 5% increase in free-time physical activity

EAB Tree Loss & Public Health

1990 to 2007, 1,296 counties in 15 states infected areas vs. no bugs
15,000 more deaths from cardiovascular disease
6,000 more deaths from lower respiratory disease controlled for demographic, human mortality, and forest health data at the county level

Toledo, Ohio in 2006, pre EAB

2009, EAB in neighborhood

photo credits: Dan Herms, Ohio State U
Sacramento Study :: LIDAR x CHIS data
7,900 adults, 250 m buffer, covariates

more tree cover = better overall health = better social cohesion

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
City Trees & Human Health

newborn & infant health
increased physical activity for kids
overall adult health
social cohesion
respiratory & cardiovascular health
reduced depression
Story: Human Health Benefits Across the Life Cycle
Evidence to Action

40 years of research
nearby nature for health benefits
> 3,500 published articles
research to application

trees & stormwater management
co-design for health co-benefits
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*
Healthy Microbiome

- control obesity & asthma
- boost immune function
- improve mental health

need contact with ‘Old Friends’

put aside the Hygiene Hypothesis
~10 to 100 trillion microbes in healthy gastrointestinal (GI) tract

Arrieta et al. 2014. Frontiers in Immunology
Fiddleheads Forest School
Washington Park Arboretum (Seattle)

cognitive
social &
physical
learning
health agencies recommend moderate activity for health promotion & disease prevention

parks, active living, active transit
Walking Programs

children

elders

families
Parks Prescription

RX for Health

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. Get a prescription for ParksRx from your healthcare provider.
2. Visit www.REACHforbetterhealth.com
   2. Enter your zip code
   3. Click
3. Pick your park
4. Exercise in the park and share outcomes with 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.
Green Streets for Walkability

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

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.
Shinrin yoku (forest bathing)
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
Shinrin-yoku (forest bathing)
Malmo, Sweden – SUDS for cloudburst management
Malmo, Sweden – SUDS for cloudburst management
Intentional green infrastructure design for human health outcomes

Cascading Benefits
Designing Green Stormwater Infrastructure for Human Wellness

co-author: 

co-author & printing:

The Nature Conservancy
Effects of nature window view on recovery from surgery (Roger Ulrich, 1984)

- Shorter stays
- Less pain
- Fewer minor complications
- Better emotional well-being
Legacy Good Samaritan Medical Center
Stenzel Healing Garden 1997
Rehabilitation Institute of Oregon
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
Summary

trees, green space, stormwater mgmt
evidence of nature for health research! decades! 1,000s of studies solutions + economic opportunities co-design for co-benefits