Healthy Trees, Healthy Communities
Making the Connection with Nearby Nature

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Outline

1. Health & Nature: the evidence
2. Emerging Programs
3. Goals & Metrics
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
Green Cities: Good Health
www.greenhealth.washington.edu

Sponsors:
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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.
Green Cities: Good Health
database of >4,500 peer reviewed publications
Introduction

Writers, philosophers, and naturalists have praised the benefits of nature for human health, happiness, and well-being for centuries, but only relatively recently have researchers begun studying and quantifying the complex relationship between human health and nature.

In 1954, Roger Ulrich, professor and director of the Center for Health Systems and Design at Texas A&M University, published the results of a pioneering study that looked at the recovery rates of gall bladder surgery patients in relation to the views from their rooms in a Texas hospital. Some of the patients looked out over a garden and grove of trees, while others had a view of a brick wall. Ulrich found that patients with a natural view spent fewer days in the hospital and used fewer pain medications (Ulrich 1984).

Ulrich’s study helped open the door to a new field of inquiry focused on illuminating the ways that nature influences our physical, mental, and social lives. More than three decades later, a broad and diverse body of scientific literature describes the human health value of nature, confirming that trees, parks, gardens, and other natural settings are essential to livable and sustainable cities as the other critical systems that keep their residents moving and working.

Findings from the current literature indicate the wide range of effects.

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Science Review

nearby nature & health evidence
> 40 years
> 5,000 publications

what are the ‘stories’?
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
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
Sacramento Study :: LIDAR x CHIS data
7,900 adults, 250 m buffer, covariates

more tree cover
= better overall health
= better social cohesion

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
Elders: horticulture for mobility & social connections
Lifecycle :: disease & illness

Cumulative U.S. DALYs for the Leading Disease/Disorder Categories by Age (2010)

Disability Adjusted Life Year

Data courtesy of WHO
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Fiddleheads Forest School
Washington Park Arboretum (Seattle)

cognitive
social &
physical
learning
CDC moderate activity recommendations

parks, active living, active transit
Walking Programs

children
collectors
families
Shinrin yoku (forest bathing)

- extensive research
- restorative experiences
- workers retirees
- networked system, 52 bases in Japan
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.

Made possible with funding from the Centers for Disease Control and Prevention.
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.
Nature and Creativity

http://www.jimkukral.com/
Give Your Ideas Some Legs

creative test – analogy generation
conditions: sit inside, treadmill walk, walk outside, wheelchair outside

walking outside produced most novel & highest quality analogies – walking opens up free flow of ideas

Oppezzo & Schwartz. 2014. Journal of Experimental Psychology
Walking Meetings

creativity, energy, communication, health
Outline

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design: milepost

author: The Nature Conservancy

printing: Forest Service


Kathleen L. Wolf, Ph.D.

also in Spanish!
Nearby nature experiences are important across the entire life cycle, from cradle to grave.

Research about nature benefits and economic value is fairly new. Some of the quantified health benefits of nature in cities are easier to convert to economic value than others. Here are some preliminary valuations—estimated for the entire US, on an annual basis.

**INFANTS**

**BIRTH WEIGHT**

ECONOMIC VALUE: US$30 SAVINGS PER BABY ON ANNUAL HEALTH CARE COSTS.

Birth weight influences long-term childhood health and development, and has been linked to some adult diseases. Low birth weight is associated with both short- and long-term health care costs, such as more frequent hospital stays and increased risk of adult diseases like heart disease. Pregnant women who have more tree cover and green space near their homes generally have babies with healthier birth weights.

**IMMUNE FUNCTION**

ECONOMIC VALUE: STRONGER IMMUNE RESPONSES LEADS TO REDUCED ILLNESS AND EARLY DEATH ACROSS A LIFETIME.

We are most vulnerable in the early months of our lives, when the body and mind are growing and developing at an astonishing rate. The "nature hypothesis" suggests that early contact with nature or natural surroundings can shape a healthy immune response that sets the stage for a lifetime of well-being.

**FAMILY DYNAMICS**

ECONOMIC VALUE: IMPROVED FAMILY DYNAMICS, PERHAPS REDUCING MENTAL HEALTH TREATMENT AND COUNSELING SERVICES

An infant's parents and siblings adjust their lives after a baby arrives, and the changes can bring on stress and anxiety. Nature walks and other outdoor activities can help reduce these conditions and improve interactions between family members.

**INFANTS**

**CHILDREN & TEENS**

**OVERALL HEALTH AND WELL-BEING**

ECONOMIC VALUE: INCREASED PHYSICAL ACTIVITY, REDUCED ASTHMA, AND LEAD TO HEALTHIER CHILDREN AND LESS MEDICATION USE.

Growing up in nature is associated with better mental health and well-being. Children who spend time outdoors have lower rates of asthma, allergies, and behavioral problems. Playing in nature helps children develop physical skills, social skills, and emotional regulation, all of which contribute to overall well-being.

**ADHD**

ECONOMIC VALUE: POTENTIAL SAVER ON MEDICATION SAVINGS PER YEAR.

Millions of children across the US are treated for Attention Deficit Hyperactivity Disorder (ADHD). Exposure to nature can be a potential alternative treatment, studies show that children who spend time in nature show improvements in attention, learning, and social skills.

**FUTURE FINANCIAL SUCCESS**

ECONOMIC VALUE: POTENTIAL INCREASE IN HIGH SCHOOL GRADUATES' LIFETIME INCOME.

Exposure to nature and green spaces can improve students' capacity to learn and succeed in school. Green spaces can also help reduce stress and improve overall well-being.

**ADULTS**

**DEPRESSION AND STRESS**

ECONOMIC VALUE: REDUCED DEPRESSION RATES AND IMPROVED MENTAL HEALTH.

Many adults experience high levels of stress and anxiety, which can lead to depression and other mental health issues. Nature exposure can help reduce stress levels and improve mental health, leading to better overall well-being.

**CARDIOVASCULAR DISEASE**

ECONOMIC VALUE: POTENTIAL SAVING ON TREATMENT COSTS ANNUALLY.

Cardiovascular disease is the leading cause of premature death in the US. Regular exposure to nature can help reduce the risk of heart disease and stroke.

**CRIME & SAFETY**

ECONOMIC VALUE: POTENTIAL SAVING ON CRIME AND SAFETY.

Nature exposure can reduce the risk of crime and improve safety. People who spend time in nature have lower rates of crime and violence.

**OLDER ADULTS**

**MOBILITY & QUALITY OF LIFE**

ECONOMIC VALUE: POTENTIAL SAVING ON HEALTH CARE COSTS FROM FALLS PER YEAR.

Falls are a leading cause of injury in older adults. Nature exposure can help reduce the risk of falls and improve mobility.

**HYDRTENSION**

ECONOMIC VALUE: POTENTIAL SAVING ON MEDICATIONS.

Hypertension, or high blood pressure, is one of the five most expensive conditions affecting older adults. Exposure to nature can help reduce blood pressure and improve overall health.

**COGNITIVE DISORDERS**

ECONOMIC VALUE: POTENTIAL SAVING ON MEDICAL SERVICES, NOT COUNTING THE VALUE OF HOME CARE SERVICES.

Exposure to nature can help improve cognitive function, especially in older adults. Nature exposure can help reduce the risk of cognitive decline and dementia.

**CONTRIBUTING ANALYSTS**

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Trees, Income & Health

▲ income ▲ health care ▲ health

11 more trees in a city block
decreased cardio-metabolic conditions =
increase in annual personal income
  of $20,000, or
moving to a neighborhood
  with $20,000 higher median income

*Kardan, et al. 2015. Scientific Reports 5, 11610*
Canopy Cover & Stress

images of canopy cover varied 0-60%

Vegetation & Mental Health

- vegetation cover and afternoon bird abundances
- lower prevalence of depression, anxiety, and stress:
  depression, more than 20% cover,
  anxiety, more than 30% cover,
  stress, more than 20% cover

Summary:  
Knowledge to Practice

- nearly 40 years of research
- critical mass of evidence – now what?
- greening or health programming
- integrating urban forest goals with broader urban systems needs