Nature for Human Health: taking care of business . . . and myself

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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

Determinants of Health

Social and community networks

Individual lifestyle factors

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
Finding that study . . . . . .
Green Cities: Good Health
www.greenhealth.washington.edu

Sponsors:
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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.
distribution of ~4,200 studies, 1970s to 2015
Evidence-based ‘Story’

Health across City Systems & Scales
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
Sacramento Study :: LIDAR x CHIS data
7,900 adults, 250 m buffer, covariates

more tree cover
= better overall health
= better social cohesion

Ulmer et al. 2016. Health & Place. Multiple health benefits of urban tree canopy: The mounting evidence for a green prescription
spatial linkages: the city becomes the park

TKF Foundation :: Nature Sacred initiative
Evidence-based ‘Story’

Health across the Human Life Cyle
‘Cradle to Grave’
Discovery: 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
Eat Dirt!
Alzheimer’s Disease & Dementia
Provide wander gardens & horticulture therapy

- 10.5% reduction in amount of medications used in dementia facility
- 30% fewer falls, accompanied by a reduction in fall severity

Detweiler et al. 2009. *American Journal of Alzheimer’s Disease and Other Dementias*

[Image: Tim Lynch Associates]

[Image: www.rph.org/eden.html]
Evidence-based ‘Story’

*Mental Health & Function*
Classroom Views & Stress

Li & Sullivan.
Landscape & Urban Planning, 2016
Classroom Views & Stress high school student response

Fig. 2. Attention scores at the end of class activity and break (Means and SE).

Fig. 3. Physiological stress at the end of class activity and break (Mean and SE).
Attention Restoration Theory
Rachel & Stephen Kaplan, U of MI
Workplace Nature & Attention Recovery

**Well-being**
- desk workers without view of nature reported 23% more ailments in prior 6 months

**Job Satisfaction**
- less frustrated and more patient
- higher overall job satisfaction and enthusiasm

ART Design Elements

- being away
- ‘soft’ fascination
- extent
- compatibility
Mind Full, or Mindful?
constant busyness

attempted multi-tasking

‘out of balance’

Anna and Elena Balbusso, NY Times
Nature and Mindfulness

focus
soft fascination
undirected attention

Attention Restoration Theory, Kapan & Kaplan

credit: Michael Hellgren
Mindfulness/Meditation Training

- meta analysis; clinical/non situations
- focus on moment-to-moment experience and mental awareness

Results

- more veridical perception (reality check)
- reduce negative affect
- improve vitality and coping
- medical symptoms & sensory pain

Mindfulness/Meditation Training

- healthy workplace employees
- 8 week mindfulness training

Results

- brain electrical activity – positive affect
- brain activation – reduced stress event response
- more antibodies after influenza vaccine = better immune function

Davidson et al. 2003. Alterations in Brain and Immune Function Produced by Mindfulness Meditation. Psychosomatic Medicine
Green Streets for Walkability

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

Aspinall et al. 2013. The Urban Brain: Analysing Outdoor Physical Activity with Mobile EEG. British Journal of Sports Medicine
% of U.S. Population Using Mental Health Medications
2001 vs 2010

America’s State of Mind, Medco Health Solutions, Inc
Prevalence of Adult Antidepressant Use
2001 vs 2010

America’s State of Mind, Medco Health Solutions, Inc
Physical Activity & Depression Reduction

- Review of 13 high quality studies
  - Exercise recommended for mild to moderate depression
  - People who are willing & motivated
  - Associated meditation and mindfulness are important

Improving Depression

20 adults with major depression walk in a park setting and an urban setting

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

Cognitive and affective improvements after walking in a nature setting

Berman et al. 2012. Journal of Affective Disorders
Evidence-based ‘Story’

*Economic Values of Nature & Health*
The diagram illustrates the concept of market equilibrium in economics. The x-axis represents quantity, while the y-axis represents price. The intersection of the demand and supply curves at point P and Q indicates the equilibrium price (P) and quantity (Q). This is the point where the quantity demanded equals the quantity supplied, maintaining market balance.
Publications


* Research and publications were funded in part by the U.S.D.A. Forest Service, National Urban and Community Forestry program, as recommended by the National Urban and Community Forestry Advisory Council (NUCFAC). Also the USFS Pacific Northwest Research Station.
Nearby nature experiences are important across the entire life cycle, from cradle to grave.

INFANTS

BIRTH WEIGHT

OVERALL HEALTH AND WELL-BEING

ECONOMIC BENEFITS: INCREASED PHYSICAL ACTIVITY, REDUCED AILMENTS, AND IMPROVED QUALITY OF LIFE.

IMMUNE FUNCTION

ECONOMIC BENEFITS: STRONGER IMMUNE SYSTEM LEADS TO REDUCED ILLNESS AND NEW DISEASE ACROSS A LIFETIME.

FAMILY DYNAMICS

ECONOMIC BENEFITS: IMPROVED FAMILY DYNAMICS, ENSURING HEALTHY MENTAL AND EMOTIONAL HEALTH MEANS MORE.

FUTURE FINANCIAL SUCCESS

ECONOMIC BENEFITS: INCREASED INCOME, HALTED INFLATION, INCREASED SCHOOL GRADUATION RATES.

ADHD

ECONOMIC BENEFITS: STRONGER IMMUNE SYSTEM LEADS TO REDUCED ILLNESS AND NEW DISEASE ACROSS A LIFETIME.

CARDIOVASCULAR DISEASE

ECONOMIC BENEFITS: STRONGER IMMUNE SYSTEM LEADS TO REDUCED ILLNESS AND NEW DISEASE ACROSS A LIFETIME.

CRIME & SAFETY

ECONOMIC BENEFITS: STRONGER IMMUNE SYSTEM LEADS TO REDUCED ILLNESS AND NEW DISEASE ACROSS A LIFETIME.

DEPRESSION AND STRESS

ECONOMIC BENEFITS: STRONGER IMMUNE SYSTEM LEADS TO REDUCED ILLNESS AND NEW DISEASE ACROSS A LIFETIME.

HYPERTENSION

ECONOMIC BENEFITS: STRONGER IMMUNE SYSTEM LEADS TO REDUCED ILLNESS AND NEW DISEASE ACROSS A LIFETIME.

COGNITIVE DISORDERS

ECONOMIC BENEFITS: STRONGER IMMUNE SYSTEM LEADS TO REDUCED ILLNESS AND NEW DISEASE ACROSS A LIFETIME.

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 U.S. on an annual basis.

contributing analysts:
Dr. Stephen Grado & Marcus Measells, MSU; Dr. Alicia Robbins, Weyerhaueser
annual value of $11.7 billion U.S. (2015 dollars)

- cradle to grave human life cycle
- varied expressions of urban greening (metro nature)
- evidence based human health and wellness benefits
- just beginning the analysis!
Summary

- evidence-based human health & wellness benefits
- story: benefits across city scale
- story: life course, cradle to grave
- story: mental health & function
- story: economic value
Knowledge to Practice

• nearly 40 years of research
• critical mass of evidence – now what?
• greening or health programming
• donors, grants & funding?

role in your own life?
Biophilic Design
Terrapin Bright Green
integrated nature & architecture

credit: Progressive Times
CDC moderate activity recommendations

parks, active living, active transit
Canine constitutional

A brisk walk in the park keeps Moby II in shape between dog shows. His owner, Colombian national Carlos Sandoval, got up early to give his 2-year-old Doberman its regular exercise. They both enjoy the exercise, especially on Sundays in Burnside Park.
Walking Programs

children
elders
families
Fiddleneck Forest School
Washington Park Arboretum (Seattle)
cognitive
social & physical learning
Elders: horticulture for mobility & social connections
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)

- walking
- relaxing
- workers
- retirees
- networked system
- 52 bases in Japan
Forest Therapy Road (Kubo Valley)

森林セラピーロード
(久保谷)

Takatori House

レストラン 鷹取の家
Walking Meetings

creativity, energy, communication, health
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: ________________________

medical center
Parks Prescription

1. Visit www.REACHforbetterhealth.com
2. Enter your zip code
3. Click
4. Pick your park

Exercise in the park and share outcomes with your healthcare provider.

PARKS Rx
Your Prescription For Better Health

www.REACHforbetterhealth.com/ParksRx
Made possible with funding from the Centers for Disease Control and Prevention.

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

Les Winkeler/The Southern Illinoisan

World-Herald News Service

Hope for the Warriors

Outward Bound
community tree plantings

American Forests

Tree People, Los Angeles

parks
public gardens
street trees
neighborhood
physically disabled & tree climbing!
recreational tree climbing – youth therapy
Knowledge to Practice

- nearly 40 years of research
- multiple stories
- what is the most relevant appeal
- broader partnerships

Take Care!