outdoor space = beauty . . . and . . . .
Green Cities :: Good Health
how nature improves human health and wellness

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

Western Nursery & Landscape Association
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Human Health & Wellness

plants and landscape are important!

design installations
& facilities management
Outline:
Green Cities :: Good Health

• nature and health?
• resource web site
• details of the evidence
• improved employee, client & user well-being
www.naturewithin.info
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

- Work environment
- Education
- Agriculture and food production

Social and community networks

- Living and working conditions
- Unemployment
- Water sanitation
- Health care services
- Housing

Individual lifestyle factors

- Age, sex & hereditary factors

Determinants of Health
Metro Nature Diversity

NEARBY NATURE INCLUDES A VARIETY OF SPACES AND PLACES

URBAN FOREST CANOPY

BIOPHILIC DESIGN

PARKS AND GARDENS

GREEN STORMWATER INFRASTRUCTURE
Sacramento Study :: LIDAR x CHIS data
7,900 adults, 250 m buffer, covariates

more tree cover = better overall health
= better social cohesion

Prison Inmates :: nature videos

solitary confinement, video room/exercise option

- felt significantly calmer, less irritable, more empathetic
- committed 26% fewer violent infractions

Finding that study . . . . .
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
co-author
co-author & printing: The Nature Conservancy
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!
Evidence-based ‘Story’

Health across the Human Life Cycle
‘Cradle to Grave’
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
Classroom Views & Stress

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 scores

stress scores
Green High School Campuses

• cafeteria & classroom window views with greater quantities of trees and shrubs

• positively associated with:
  • standardized test scores,
  • graduation rates
  • %s of students planning to attend a four-year college
  • fewer occurrences of criminal behavior
CDC moderate activity recommendations

parks, active living, active transit
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*
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
Neighborhoods with Trees

10 more trees on a city block? health benefits comparable to $10,000 household income increase OR being 7 years younger

Kardan et al., 2015, Scientific Reports
Walking Programs
children
elders
families

public/private sectors
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

the better office cubicle!

bottom line = $$ benefits of trees & nature
Biophilic Design
Terrapin Bright Green
integrated nature & architecture

credit: Progressive Times
Walking Meetings
creativity, energy, communication, health
Nature and Creativity

http://www.jimkukral.com/
role of nature in creativity development

http://daycare.sulekha.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
Nature & Creative Professionals

focused interviews, Denmark
makes us more curious
supports flexible thinking
recharges directed-attention

aids 2 phases of the creative process:
Preparation phase and Incubation phase

sensory dimensions: space & serene

Plambech & Konijnendijk van den Bosch. 2015. Urban Forestry & Urban Greening

www.concur.com
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*
Summary:
Green Cities :: Good Health

- environmental, social & health research findings
- cradle to grave benefits
- possible health savings
- improved employee, client & user well-being
Fiddleheads Forest School
Washington Park Arboretum (Seattle)

cognitive social & physical learning
Elders: horticulture for mobility & social connections