Urban Trees as an Upstream Solution to Promote Human Health

Kathleen Wolf, Sharon Lam, Jennifer McKeen, Gregory Richardson

University of Washington (Seattle), University of Toronto, Natural Resources Canada, Health Canada
World Health Organization
Definition of Health

A state of complete physical, mental, and social well-being and not merely the absence of disease or infirmity (1946)
Urban Nature for Health
City Trees and Human Health: A Systematic Review

**Purpose:** carefully collect and synthesize the peer-reviewed evidence concerning city trees and human health

**Sponsors:**

USDA Forest Service

Canada

Health Canada

Santé Canada
Project Team

- Kathleen Wolf, Ph.D., University of Washington
- Sharon Lam, MSc, University of Toronto
- Jennifer McKeen, MPH, Simon Fraser University
- Gregory Richardson, MUP, Health Canada
- Matilda Van Den Bosch, M.D, University of British Columbia
- Adrina BardekJian, Ph.D., Tree Canada
Methods

1. Keyword search (n=1644)
2. Abstract review (n=436)
3. Quality assessment (n=198)
4. Final article set (n=182)
5. Synthesize and present findings
Final Article Collection

- 182 articles
- Diverse methods, populations, measures, and study locations
- Conducted by multiple disciplines

Study examples and synthesis . . . .
Urban Forests and Newborns
the natural environment and 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

Sacramento, CA Study :: LIDAR x CHIS data
7,900 adults, 250 m buffer, covariates

more tree cover = better overall health
= better social cohesion

Insect Damaged Tree Loss & Public Health

1990 to 2007, 1,296 counties in 15 states
EAB 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
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
Diabetes
One in ten of the world's population will have type 2 diabetes by 2035.

Heart Disease
Heart disease is a major contributor to the growing global pandemic of cardiovascular disease and stroke.

Mental Illnesses
Mental disorders represent an ever-increasing burden, to all ages of the population, challenging mental health and health systems.

Cancer
A leading cause of chronic-disease related death in the world. More than 30% of cancers are preventable.

Lung Diseases
Chronic lung diseases such as asthma, lung cancer, and chronic pulmonary obstructive disease.
Social Determinants of Health

Determinants of Health

Social Determinants of Health
Greenspace & Health Pathways

Literature Review – City Trees & Human Health
USDA Forest Service, U of WA, Health Canada, Natural Resources Canada

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182 peer-reviewed articles

figure credit: Sharon Lam
Limitations of Evidence

• heterogeneity of study methods
• heterogeneity of tree or forest interventions
• lack of replication
• did not include qualitative studies, non English publications
• thus, cautious about some outcomes
Implications of the Review

• city trees are essential for health-supportive environments
• effects of trees vary by receptor, not always beneficial (allergy symptoms due to tree pollen)
• benefits mediated by many factors, including the health status of trees and forests
• integrated and proactive design and management
• manage to maximize health benefits and minimize potential adverse impact
• collaboration between health and environmental professionals, planning guidelines
• health equity, tree distribution
Green Cities: Good Health
www.greenhealth.washington.edu

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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.1,2 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.9
- A study found 7% higher rental rates for commercial offices having high quality landscapes.14
- Shoppers claim that they will spend 9% to 12% more for goods and services in central business districts having high quality tree canopy.34
- 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.34
Urban Nature for Human Health and Well-Being

USDA
Forest Service

2018
Outside Our Doors
The benefits of cities where people and nature thrive.
design: milepost

author: [logo]

printing: The Nature Conservancy

also in Spanish! and Arabic!
Closing

• trees in cities, create health protective environments

• 3 domains of benefit:
  • reducing harm
  • restoring capacity
  • building capacity

• = more partnerships for collaborative UF planning & management
Human Dimensions of Urban Forestry and Urban Greening

What's New?

Nature and Consumer Environments
Research about how the urban forest influences business district visitors.

Trees and Transportation
Studies on the value of having quality landscapes in urban roadsides.

Civic Ecology
Studies of human behaviors and benefits when people are active in the environment.

Policy and Planning
Integrating urban greening science with community change.

Urban Forestry and Human Benefits
More resources, studies and links . . .

Green Cities: Good Health
human health & well-being research

Projects Director
Kathleen L. Wolf, Ph.D.