Metro Nature Settings

NEARBY NATURE INCLUDES A VARIETY OF SPACES AND PLACES

Biophilic Design :: buildings

integrated nature & architecture or other structures
Students’ Questions

- Nature definitions
- Research methods, confounding
- Social determinants, nature relevance
- Effects across human life cycle, contexts
- Culture, equity & disparity
- Community change & displacement
- Urban planning & policy, authority, density

Outline

1. Health & Nature: the evidence
2. Policy Opportunities
3. Economics
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:
USDA Forest Service,
(U&CF Program + Pacific NW Research)
University of Washington
NGO partners

Thanks!
to U of WA students:
Katrina Flora
Mary Ann Rozance
Sarah Krueger

Research Reviews & Summaries
Green Cities: Good Health
database of >4,500 peer reviewed publications

Discussion

What Don’t We Know?
1. dosage – interval, frequency, kind
2. effects of other landscapes (Alaska, desert, Scandinavia), developing nations
3. optimal nearby nature for specific health outcomes, consider diversity

But what is actionable, now?
Outline

1. Health & Nature: the evidence
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Metro Nature & Health Evidence Framework

Synthesis of 40 years of peer-reviewed literature


Parks Prescription

Rx for Health

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

Date: ____________________________
Dr: ____________________________
Name: ____________________________

I recommend: □ Walking □ Other: ____________________________

_____________________ minutes a day
_____________________ days per week

*Health Canada suggests moderate activity of 30 minutes on 5-7 days per week

Signature: ____________________________
Parks Prescription

1. Visit www.PARKStoyourhealth.com
2. Enter your zip code
3. Click

Low Impact Development: A Design Manual for Urban Areas, 2010

Credit: American Planning Association
Stormwater Management

Thornton Creek Water Quality Channel (Seattle, SvR Design)
1 hectare, treats runoff from 275 hectares (1 hectare = 2.47 acres)
Effects of nature window view on recovery from surgery (Roger Ulrich, 1984)

- Shorter stays
- Less pain
- Fewer minor complications
- Better emotional well-being

Massachusetts General Hospital

Sustainability in Prisons
- offenders
- facilities
- materials for ecological restoration

sustainabilityinprisons.org
Prison Inmates :: nature videos
solitary confinement, video room/exercise option

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


Credit: ThisNation.com

**Elements of Public Policy for Health**

[Diagram showing various elements of public policy for health]

Credit: SycamoreInstituteTN.org
Discussion

Seattle: Nature for Health Policy

1. what are priority nature-based health outcomes?
2. what nature should be provided?
3. and where?
3. how does this interface with growth management/increasing density?

Outline

1. Health & Nature: the evidence
3. Economics
2. Policy Opportunities
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

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
Donovan et al. 2013, Journal of Preventive Medicine

photo credits: Dan Herms, Ohio State U

12
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

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)

cognitive and affective
improvements after
walking in a
nature setting

Berman et al. 2012.
Journal of Affective Disorders

Also in Spanish and Arabic
Valuation Strategies

Benefits Transfer approaches

- factor income
- avoided or replacement cost
- burden of illness
- hedonic pricing
- stated preference/contingent valuation
- revealed preference (e.g., travel cost)
- quality adjusted life years
- benefit/cost

Values Summary

Millions of U.S. Dollars (2012)

<table>
<thead>
<tr>
<th>Benefit (geographic scope)</th>
<th>Minimum ($)</th>
<th>Maximum ($)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Newborn Health (U.S.)</td>
<td>5.3</td>
<td>5.3</td>
</tr>
<tr>
<td>Attention Deficit Hyperactivity Disorder (U.S.)</td>
<td>303.5</td>
<td>1,917.7</td>
</tr>
<tr>
<td>Schools (U.S.)</td>
<td>20.6</td>
<td>1,262.9</td>
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<tr>
<td>Crime (U.S.)</td>
<td>340.6</td>
<td>999.4</td>
</tr>
<tr>
<td>Cardiovascular Disease (U.K., U.S.)</td>
<td>1,220.0</td>
<td>1,220.0</td>
</tr>
<tr>
<td>Alzheimer's Disease (U.S.)</td>
<td>724.6</td>
<td>1,449.2</td>
</tr>
<tr>
<td>Totals</td>
<td>2,694.4</td>
<td>6,754.5</td>
</tr>
</tbody>
</table>

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 & wellness benefits (ADHD, cardiovascular, Alzheimer's)
- just beginning the analysis!

Lifecycle :: disease & illness

Discussion
Community Economics
1. what are the elements/sources of gentrification?
2. does metro nature play a role?
3. how might displacement be avoided?
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www.naturewithin.info