Impacts of forests on human health and well-being

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Forests for Human Health: Challenges and Opportunities
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Background of the study

• Contribution of forests to human health increasingly understood within science.
• Health benefits received from urban and peri-urban, protected as well as commercial forests.
• This overview sums up current research evidence regarding health benefits of forests,
  - Focus on scientific studies on forests, woodlands and large urban parks
  - Literature reviews and meta-analyses, if available, and individual studies in peer reviewed journals.
Public Health Challenges in 2010s

Health and social problems
- Dementia
- Cardiovascular diseases
- Inactivity
- Mental health problems
- Chronical stress
- Social exclusion
- Social inequalities

Estimated costs
- Mental health problems in EU €600 billion
- Diabetes in Finland €1,3 billion (Neittaanmäki et al. 2017)
- Costs of inactivity Finland €1,5-4,4 billion (Vasankari ym. 2018)
Suggested mechanisms for forest health benefits

Individual differences: Age, sex, socio-economic & health status, nature relationship, environmental preferences

(Tyrväinen et al.. 2018, adapted Hartig et al. 2014)
Research approaches and themes

Long-term exposure to nature

- GIS data and health status
- Amount, size and location of nature spaces

Short-term exposure to nature

- Surveys on use of nature and health status
  - Types and qualities of naturespaces
  - Individual differences
- Field experiments
- Mechanisms and health outcomes

IMPLEMENTATION & KNOWLEDGE TRANSFER
Impact of forests on mental health

• Short-term mental health benefits from nature contact well documented.
• Forest visits increase positive emotions and decrease subjective stress and negative emotions (e.g. Meyer & Kotsch, 2017; O’Brien et al., 2014; Tyrväinen et al. 2014).
• They to improved attention restoration (e.g. Berman et al. 2008; Hartig et al 2003; Laumann et al., 2003).
• Only few studies evaluating long term effects and recovery from illnesses.
Physiological health benefits

• Less evidence of an effect compared to psychological effects; most studies conducted in Japan and South-Korea.
• Beneficial changes in human physiology in forests compared to urban environments:
  - Lower stress hormone (cortisol) concentration (e.g. Tsunetsugu et al. 2007, 2013).
  - Reduced blood pressure and pulse rate, heart rate variability, muscle tension (e.g. Lee et al. 2013, Lanki et al. 2017).
• Drawing solid conclusions somewhat hampered by the heterogeneity of study designs and small sample sizes.
Nature strengthening human immune response.

• Contact with nature affects human microbiota and is suggested to improve immune function.
  -> loss of biodiversity suggested to be linked to non-communicable diseases such as allergies (e.g. Hanski et al. 2012).

• A lower prevalence of atopy and atopic diseases in children living in rural areas compared to urban areas (e.g. von Hertzen et al. 2015)
  -> children in rural areas are more exposed to soil microorganisms.
Physical activity benefits

• Nature areas suggested to provide a safe and an attractive setting for physical activity (Mytton et al., 2012; Astell-Burt et al., 2014; James et al. 2015).

• Individual and cultural differences how forest environments are perceived and used and can be accessed in Europe.

• Larger nature areas, often forested nature areas attract people for green exercise (Giles-Corti 2005, Pyky et al 2018).

• Green exercise has added value to benefits of PA by providing also mental health benefits (Thompson et al., 2011, Mitchell 2013, Pasanen et. al. 2014).
Social benefits

• Shared nature experiences can be an important benefit for people (e.g. O’Brien and Morris, 2013).

• For women company is more important due to feelings of safety and being insecure (Morris et al. 2011).

• Solitude is more effective than company in regaining the capacity for directed attention (Staats & Hartig 2004).

• Social contacts among children during outdoor play may positively affect socio-emotional development and social cohesion (e.g. Flannigan and Dietze 2017).

• Forests provide opportunities to participate in community focused activities.
Factors affecting health outcomes

- Duration and frequency of the visit
- Activities performed in forests
- Individual differences:
  - for example age, health status, environmental preferences and nature relatedness, cultural background have an effect.
Dangers and risks

- Important to recognize ‘ecosystem disservices’ that include:
  - Allergenic reactions linked to specific tree species,
  - Pests and pathogens in the forests
  - The risk of injuries due to falling limbs or trees,
  - Tick-borne diseases such (e.g. Lyme disease and the tick-borne encephalitis).
- Risk of picking up poisonous mushrooms and plants (Tomalak et al. 2011).
Conclusions and policy implications

• *Forests have considerable potential in public health promotion and disease prevention in Europe.*

• Research needed to study the dose-response relationship, individual differences, long-term health effects and, the use of forests in rehabilitation and recovery from illnesses.

• Gaps in scientific knowledge hinder economic valuation of the health benefits of forests.

• European and national forestry policies should address more specifically public health promotion as a target.
Conclusions and policy implications

• Policies focusing more on sustaining forests and woodlands in and around towns and cities are needed.
• Monitoring of outdoor recreation and linked health benefits should be developed.
• Increased collaboration needed between forestry experts, planners and landscape architects as well as health sector experts
• Policy instruments supporting pilot projects, research, education and communication are needed to put current evidence-base into practice.
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Thank you!