Trees and Public Health

A Summary for Healthcare Professionals

Mental Health and Emotional Well-Being

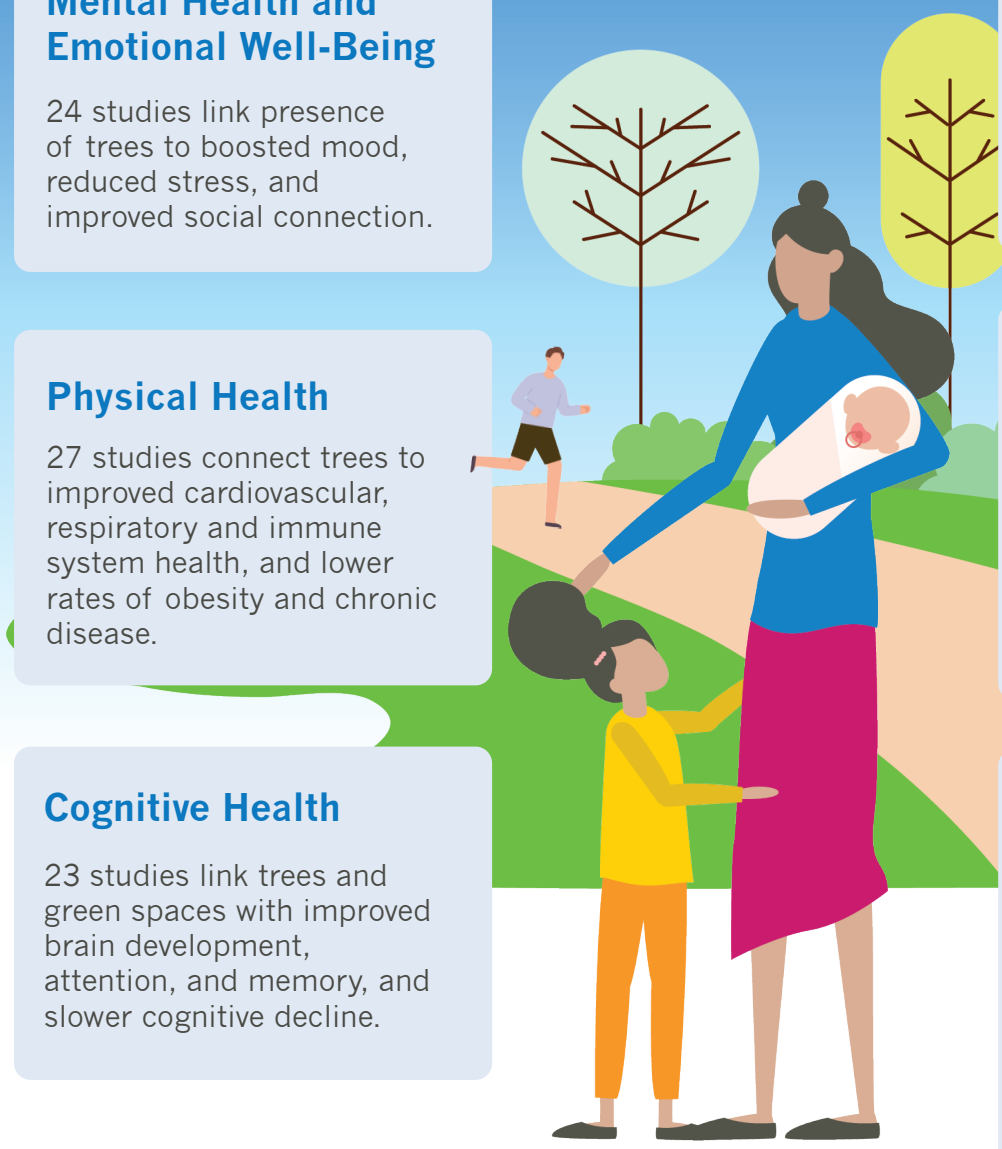
24 studies link presence of trees to boosted mood, reduced stress, and improved social connection.

Physical Health

27 studies connect trees to improved cardiovascular, respiratory and immune system health, and lower rates of obesity and chronic disease.

Cognitive Health

23 studies link trees and green spaces with improved brain development, attention, and memory, and slower cognitive decline.



Injury and Heat-Related Illness

18 studies highlight how trees protect against heat-related health risks and injury.

Maternal Health, Pregnancy, and Birth Outcomes

22 studies associate increased tree canopy and exposure to green space with healthier pregnancies and better birth outcomes.

Community Health and Resilience

26 studies demonstrate how trees and greenspaces create stronger neighborhood ties, decrease all-cause mortality, and foster more resilient communities.

Cleveland Clinic

GREAT LAKES ST. LAWRENCE GOVERNORS & PREMIERS

A growing body of global and U.S.-based research spanning more than four decades (1980's-2020's) indicates that exposure to trees and green spaces is associated with improved public health across all life stages[1]. From healthier pregnancies and improved childhood brain development to lower stress and chronic disease risk in adults, to longer and more satisfying lives for seniors, trees support health, resilience, and well-being.

Trees and green spaces are more than aesthetic landscape features; they are essential public health infrastructure. Greener environments improve environmental conditions by:

- Filtering air pollutants
- Reducing traffic noise
- Providing shade that lowers surface temperatures on hot days
- Protecting against harmful UV radiation.

Together these effects reduce heat-related illnesses and mortality. In the United States, it's estimated that trees and tree canopy prevent approximately 850 deaths and 670,000 incidences of acute respiratory symptoms annually by improving air quality[2].

Green spaces also encourage health-promoting behaviors like physical activity, social interaction, and psychological restoration, which supports recovery from stress and mental fatigue. Exposure to green space fosters both:

- Direct physiological benefits (e.g. reduced exposure to pollutants improves cardiovascular and respiratory health), and
- Indirect psychosocial outcomes (e.g. stress reduction leads to better mental health and improved immune function).

Research also links exposure to trees and green spaces to stronger social cohesion, lower crime rates, and improved community well-being.

Perhaps most striking, greener cities are literally healthier cities. Large epidemiological studies in the U.S., Canada, and Europe have found that residents in areas with more tree cover and vegetation have lower all-cause mortality rates. For instance, one study of over 100,000 U.S. women found a ~12% reduction in overall mortality among those living near higher vegetation density[3].

In 2023, the International Union of Forest Research Organizations (IUFRO) released a global assessment which concluded that "forests, trees and green spaces play a vital role in ensuring a healthy life for all," with health benefits "ranging from physical and mental well-being to overall mortality reduction"[4]. This comprehensive report and many other studies have established that the presence of trees in cities and exposure to trees is a critical component of healthy, livable communities.

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[1] Select sources (peer-reviewed articles, systematic reviews, reports sources) will be included in the footnotes. A compiled list of sources organized by health outcome will be included in the references (pgs. 4-9).

[2] Tree and forest effects on air quality and human health in the United States (https://doi.org/10.1016/j.envpol.2014.05.028)

[3] A Review of Epidemiologic Studies on Greenness and Health: Updated Literature Through 2017 (https://doi.org/10.1007/s40572-018-0179-y)

[4] IUFRO World Series Vol. 41 - Forests and Trees for Human Health: Pathways, Impacts, Challenges and Response Options (https://www.iufro.org/publications/world-series-vol-41-forests-and-trees-for-human-health-pathways-impacts-challenges-and-response-options)

Key Health Benefits of Trees

Studies, including systematic review and meta-analyses, have linked exposure to trees, green space, and forest canopy to improvements across all life stages in the following categories:

Mental Health and Well-being[5]

- Lowers feelings of stress, anxiety, and depression
- Improved mood and emotional well-being
- Reduced use of antidepressant medications
- Greater social connection and cohesion

Physical Health[6]

- Lower risk of obesity, hypertension, and chronic diseases
- Reduced cardiovascular disease and stroke risk
- Fewer respiratory illnesses and asthma hospitalizations
- Protection from heat-related illness and UV exposure

Cognitive Development and Brain Health[7]

- Improved attention, memory and executive functioning
- Reduced ADHD symptoms
- Slower cognitive decline and lower dementia risk in older adults

Pregnancy and Birth Outcomes[8]

- Fewer preterm births
- Higher average birth weights
- Improved maternal mental and physical health during pregnancy

Community Health and Resilience[9]

- Stronger neighborhood ties and perceived safety
- Increased opportunities for physical activity
- Decreased all-cause mortality and morbidity

These benefits are supported by dozens of large-scale studies and systematic reviews, including many U.S., Canadian and international researchers.

Clinical Implications

Green space is a non-pharmacologic intervention with wide-reaching health benefits. Trees and greenspace are a "green prescription" for public health. Encouraging patients to spend just 20-30 minutes a day outdoors among trees and green space can improve physical and mental health for children, adults, and the elderly. Print and distribute the infographic on page 10 to help counsel patients on the benefits of trees.

Healthcare systems and public health agencies are beginning to treat green infrastructure as a determinant of health. Tree canopy data, like American Forest's Tree Equity Score[10], can help inform community health planning. Healthcare systems can advocate for green space access as a structural determinant of health.

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[5] Multiple health benefits of urban tree canopy: The mounting evidence for a green prescription (https://doi.org/10.1016/j.healthplace.2016.08.011)

[6] Urban Trees and Human Health: A Scoping Review (https://doi.org/10.3390/ijerph17124371)

[7] Urban Green Space and Its Impact on Human Health. (https://doi.org/10.3390/ijerph15030445)

[8] Urban trees and the risk of poor birth outcomes (https://research.fs.usda.gov/treesearch/39615)

[9] Current inequality and future potential of US urban tree cover for reducing heat-related health impacts (https://www.nature.com/articles/s42949-024-00150-3)

[10] American Forest Tree Equity Score Tool: https://www.treeequityscore.org/

Reference List

The following pages contain a curated reference list (1980's-2020's), including peer-reviewed studies, comprehensive reviews, and authoritative reports, that establish the health benefits of trees and green space across populations. Each source was selected for its contribution to understanding the link between trees/green space and health.

Comprehensive Resources: *Synthesizes current research to examine how forests, trees, and/or green spaces affect human health across all life stages. All resources listed below explore the effect of trees on multiple (10+) mental and physical health outcomes.*

European Environment Agency. (2022). *Who benefits from nature in cities? Social inequalities in access to urban green and blue spaces across Europe*. https://www.eea.europa.eu/en/analysis/publications/who-benefits-from-nature-in-cities-social-inequalities-in-access-to-urban-green-and-blue-spaces-across-europe

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Mental health and emotional well-being (e.g. stress, mood, social cohesion)

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Physical health (e.g., cardiovascular, respiratory, immune system, obesity and physical activity, chronic disease)

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Community Health and Resilience (e.g., surgery recovery, crime rate, inequity, cancer, morbidity, mortality)

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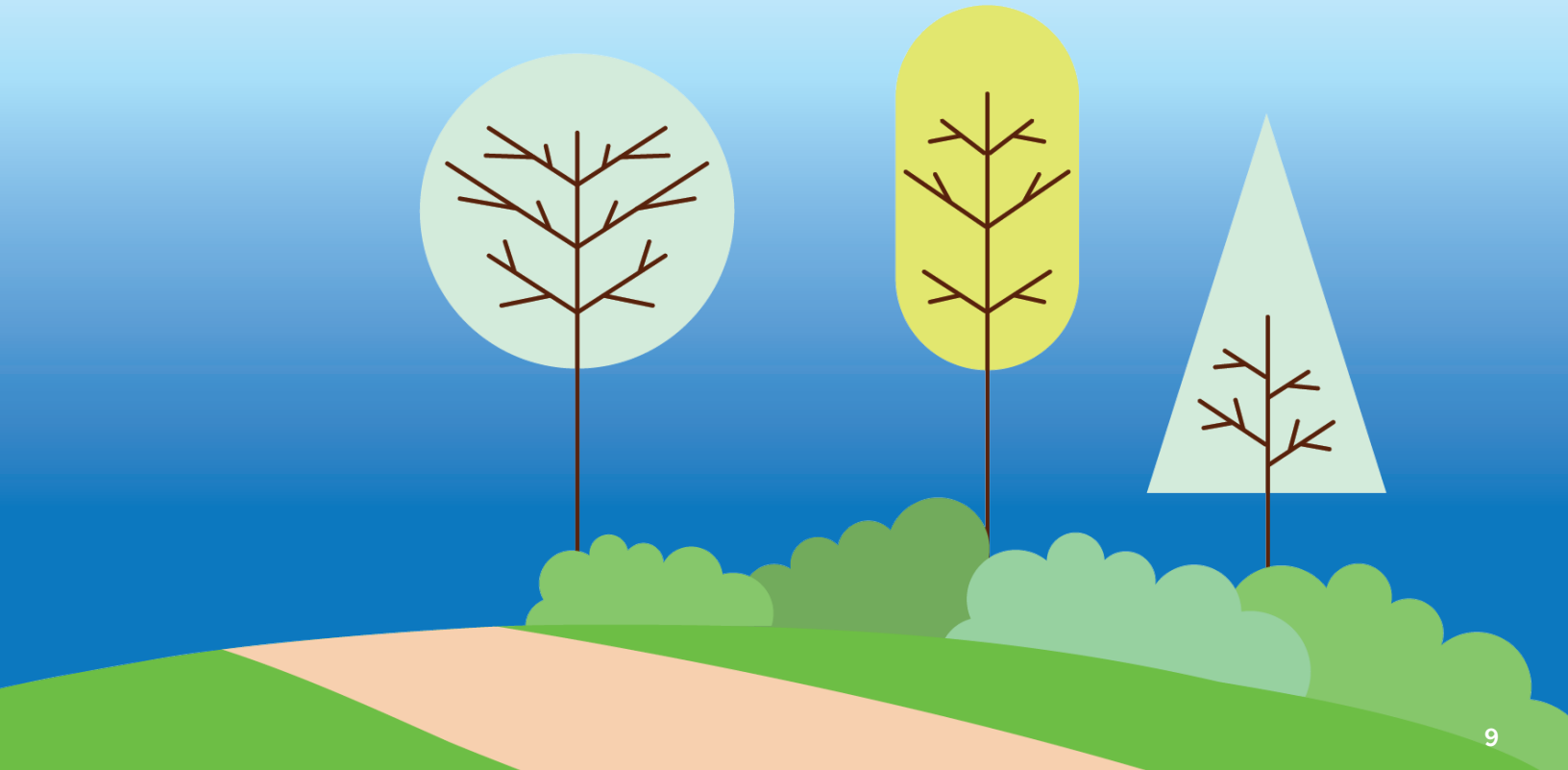

Spend 20-30 minutes a day near a tree.

Improve mental health and well-being

Trees reduce feelings of anxiety, depression, and stress, which improves your mental health and well-being.

Strengthen heart health

Spending time outside and around trees can make you want to exercise more. Exercising helps you lose weight and reduces causes of heart disease.

Boost brain development

- Trees support brain development in children. Playing in and around green spaces helps increase attention span and memory.
- Symptoms of attention-deficit hyperactivity disorder (ADHD) are reduced after spending time outside.

Breathe easier

Trees improve air quality. Trees remove harmful particles, also known as pollutants, from the air that can bother your lungs and worsen symptoms of respiratory diseases, like COPD.

Reduce effects of heat and sun

- Trees provide shade which can help you cool off on hot days.
- Trees help block the sun's ultraviolet light (UV) so you are at less risk for skin cancer.

Deliver a healthier baby

Pregnant women who spend time in green spaces are less stressed. Relaxed moms-to-be have a lower chance of the baby coming early. They also give birth to healthier babies.

Heal faster from surgery

Spending time outside or seeing green space after surgery can help you heal faster.

Sources

1. Urban Nature Experiences Reduce Stress in the Context of Daily Life Based on Salivary Biomarkers | Frontiers (frontersin.org)
2. Using Trees and Vegetation to Reduce Heat Islands | U.S. EPA (epa.org)
3. Forests and Trees for Human Health: Pathways, Impacts, Challenges and Response Options | IUFRO (iufro.org)
4. Urban Trees and Human Health: A Scoping Review | PubMed (pubmed.gov)

Green spaces are good for our health. Consider doing one of the following activities at a park with trees, in your yard, or in your neighborhood:

- Walk, jog, or run
- Sit under a tree
- Picnic, BBQ or grill out with family or friends
- Play sports
- Watch birds & nature
- Create – journal, draw or paint
- Meditate or pray

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