



## FACT SHEET ADULT HEALTH AND NATURE

### Current State of Adult Health

Adult populations in the United States are burdened by chronic diseases that lead to decreased quality of life, increased health care costs, and preventable morbidity and mortality. Many of these illnesses have a strikingly disproportionate impact on minority populations and those with low socioeconomic status.

More than one third of the population, or 149 million U.S. adults over age 20, is overweight or obese.<sup>1,2</sup> Obesity is associated with increases in mortality rates and risk for widespread chronic illnesses, including type 2 diabetes, hypertension, high cholesterol, heart disease, stroke, respiratory illnesses, and some cancers.<sup>1,2</sup> Type 2 diabetes is associated with shorter life expectancy and minority adults are



twice as likely as white adults to be affected.<sup>3</sup> More than 60 million Americans have hypertension and high cholesterol, much of which is uncontrolled.<sup>4</sup> Cardiovascular disease affects 1 in 3, or more than 83 million, and heart attack and stroke are the first and third leading causes of death in the United States.<sup>4</sup> Death rates are 37% higher among African Americans than whites and American Indian and Alaska natives have the highest percentage of premature death associated with cardiovascular disease.<sup>4</sup> Asthma is another chronic illness on the rise that affects over 18 million, or 1 in 12, adults.<sup>5</sup> Multi-race and black adults, women of all races, individuals with lower income and education levels, and those who are overweight are more likely to have asthma.<sup>5,6</sup> Mental illness is also prevalent, affecting 25% of all U.S. adults, and can adversely affect the outcomes of other chronic illnesses.<sup>7</sup>

Lifestyle modification with medical management, diet, physical activity, and behavior therapy, including stress management, are recommended for the control of these conditions.<sup>3,4</sup> Nature has long been used in cultures around the world as a form of healing and a way to foster good health. Research demonstrates that contact with nature benefits people of all ages and can positively impact health. Access to nature has been related to better health, greater physical and mental well-being, restoration from stress, and greater social connectivity.

## Nature and Health

Connection with the natural environment is beneficial for the body and can positively influence health. The natural environment can aid in the healing process and potentially prevent negative outcomes for hospitalized patients. One study looked at the view outside the window of twenty three matched pair post-op cholecystectomy patients. Those facing natural environments, compared to a brick wall, were shown to have shorter hospital stays, received fewer negative evaluative comments from nurses, and took less pain medication.<sup>8</sup> Another study looked at using distraction with sights and sounds of nature during flexible bronchoscopy with conscious sedation to reduce pain. Researchers found a four to five-fold increase in pain control in intervention groups compared to control groups.<sup>9</sup> Studies from Japan connect *Shinrin-yoku*, or bathing the senses in the forest environment, with health benefits when compared to city settings. This immersion in nature is shown to lower pulse rate and blood pressure, and decrease sympathetic nerve activity, the body's natural stress response.<sup>10</sup> One study specifically connected forest bathing with a reduction in blood pressure and inflammation in the elderly.<sup>11</sup> Large epidemiological studies in Canada, Denmark, Japan, and the Netherlands that control for potential socioeconomic and demographic factors show that having access to nature lowers rates of cardiovascular disease, stroke, obesity, and depression<sup>12-16</sup> and is associated with better immune system functioning<sup>17</sup> and fewer health problems.<sup>18</sup>

## Physical Activity and Well-Being in Nature



Physical activity promotes health and can have a substantial impact on the state of chronic disease. Life expectancy, obesity, type 2 diabetes, cardiovascular disease, mental illness, and even quality of sleep have all been shown to improve when individuals increase physical activity. In addition to the health disparities that exist for these diseases, data shows that some minority groups are less likely to get the exercise needed to meet recommended levels.<sup>19</sup>

A number of studies connect physical activity in outdoor natural environments with greater physical and mental well-being. Across socioeconomic levels, people are more likely to walk if they live near parks and a positive association exists between physical activity and access to green space.<sup>20-23</sup> A large study in England revealed that those living closer to parks are more likely to achieve recommended levels of physical activity.<sup>24</sup> Epidemiologic studies indicate that an active lifestyle protects brain functioning in the elderly and can delay onset of dementia and Alzheimer's Disease.<sup>25,26</sup> Adults getting active by volunteering at least 200 hours over a four year study were 40% less likely to develop high blood pressure.<sup>27</sup> Another study found that even looking out a window at natural elements or settings has been shown to increase aspects of well-being and satisfaction with where people live.<sup>28</sup> It has been shown that looking at nature pictures while

running on a treadmill yields a significant improvement in blood pressure and a positive effect on mood and self-esteem.<sup>29</sup> Furthermore, exercise within a natural environment, when compared to indoor exercise, is associated with decreases in tension, confusion, anger, and depression.<sup>30</sup> Study participants with major depressive disorders have been shown to have increases in mood and a significant increase in memory span after a nature walk compared to an urban walk.<sup>31</sup> Researchers in Edinburgh looked at EEG recordings while participants took a 25 minute walk and results showed evidence of lower frustration, engagement, and arousal, and higher meditation when moving into green space.<sup>32</sup> Another study took participants backpacking in the wilderness for 4-6 days without access to electronic technology and found that creativity and problem solving increased by 50%, supporting the positive effects of immersion in a natural setting.<sup>33</sup>

### Nature as a Stress Reducer

Some stress can be a positive and motivating force. Chronic stress, however, can have negative impacts on health and exacerbate illness. Many studies associate access to nature with reduced levels of stress. Studies have shown that participants report less stress the more often they visit green spaces and have access to nature.<sup>21,34,35</sup> When residents of public housing have views of trees rather than entirely built surroundings, they show greater capacity to cope with stress, better conflict management, and lower levels of family aggression.<sup>36-38</sup> One study utilized salivary cortisol sampling to look at green space and stress in deprived communities. Researchers found a significant positive correlation between decline in cortisol and increased quality of green space in the living environment of deprived communities.<sup>39</sup> Another study found decreases in cortisol levels and mood enhancement with 30 minutes of outdoor gardening, further highlighting nature as a valuable resource for health promotion.<sup>40</sup>

### Social Interaction in Nature

Positive social connectivity can improve the lives and health of individuals and the communities they live in. Social support provides a buffer against stress, anxiety, and depression, which can all adversely affect chronic illness.

The natural environment helps to connect people. One study found that 83% more participants engaged in social activity in greenspace, as opposed to barren space.<sup>41</sup> Participation in community gardens is associated with reduced social isolation, a sense of collective efficacy, and increased social networks, social involvement, and neighborhood attachment.<sup>42-45</sup> Among public housing residents, having green views predicts a



stronger sense of community and more social ties with neighbors and greener surroundings are associated with a greater sense of safety.<sup>37,38</sup>

## **Recommendations**

### **U.S. Department of Health and Human Services**

The 2008 Physical Activity Guidelines advise adults to be physically active with aerobic and muscle-strengthening activities. Recommended aerobic activity may consist of at least 2 hours and 30 minutes of moderate activity, 1 hour and 15 minutes of vigorous activity, or a combination of both every week.<sup>46</sup> Muscle strengthening activities should be done at least 2 days per week to work all major muscle groups.<sup>46</sup> Active adults are less likely to develop many chronic illnesses and have a healthier body size and composition. Both men and women of all races and ethnicities have been shown to benefit from the recommended activity levels. The 2008 Physical Activity Guidelines are available at: [www.health.gov/PAGuidelines/guidelines/default.aspx](http://www.health.gov/PAGuidelines/guidelines/default.aspx).

### **Centers for Disease Control and Prevention:**

The CDC encourages adults to participate in both aerobic and strengthening activities several days per week for health benefits. The CDC provides strategies for all ages to get active, available at: [www.cdc.gov/physicalactivity/index.html](http://www.cdc.gov/physicalactivity/index.html). The CDC also advises adults to engage in healthy outdoor activity, such as walking and gardening. For more information, visit [www.cdc.gov/features/VitalSigns/Walking](http://www.cdc.gov/features/VitalSigns/Walking) and [www.cdc.gov/Features/gardeningtips](http://www.cdc.gov/Features/gardeningtips).

### **Surgeon General:**

The *Surgeon General's Vision for a Health and Fit Nation 2010* report recommends walking outdoors in their communities to promote better health. Americans are encouraged to add walking to daily routines to promote regular physical activity. For more information, visit: [www.surgeongeneral.gov/initiatives/walking/index.html](http://www.surgeongeneral.gov/initiatives/walking/index.html).

### **American College of Sports Medicine:**

Exercise is Medicine is a program coordinated by the American College of Sports Medicine to encourage physicians to prescribe, assess, and review physical activity plans for all patients at every visit. Physical activity is recommended to help prevent and manage chronic illness. It has been suggested that patients would be more inclined to exercise if told by a physician. Recommendations on how to exercise safely with a variety of health conditions is provided. For more information, visit [www.exerciseismedicine.org](http://www.exerciseismedicine.org).

## **Conclusion**

The power of nature cannot be underestimated. Evidence suggests that nature can improve many aspects of health and decrease the burden of chronic disease. The benefits of nature should be

emphasized by health practitioners, policy makers, housing agencies, and natural resource departments. Access to natural areas and green spaces should be a priority for all people, no matter their age, socioeconomic status, or living environment.

## References

- [1] Ogden C, et al. (2012). Prevalence of Obesity in the United States, 2009-2010. National Center for Health Statistics: NCHS Data Brief No. 82.
- [2] American Heart Association. (2012). Heart Disease and Stroke Statistics-2012 Update : A Report From the American Heart Association. *Circulation*, 125:e2-e220.
- [3] Centers for Disease Control and Prevention. (2011). Diabetes Successes and Opportunities for Population-based prevention and control.
- [4] Centers for Disease Control and Prevention. (2011). Heart Disease and Stroke Prevention: Addressing the nation’s leading killers.
- [5] Centers for Disease Control and Prevention. (2011). Asthma’s Impact on the Nation.
- [6] Von Behren J, et al. (2009). Obesity, waist size and prevalence of current asthma in the California Teachers Study cohort. *Thoracic*, 64:889-893.
- [7] Centers for Disease Control and Prevention (2011). Mental Illness Surveillance Among U.S. Adults.
- [8] Ulrich RS (1984). View through a window may influence recovery from surgery. *Science*, 224(4647):420-421.
- [9] Diette GB, et al. (2003). Distraction therapy with nature sights and sounds reduces pain during flexible bronchoscopy: a complementary approach to routine analgesia. *Chest*, 123(3):941-948.
- [10] Park B, et al. (2009). The physiological effects of Shinrin-yoku (taking in the forest atmosphere or forest bathing): evidence from field experiments in 24 forests across Japan. *Environmental Health and Preventative Medicine*,15:18–26.
- [11] Mao G, et al. (2012). Therapeutic effect of forest bathing on human hypertension in the elderly. *Journal of Cardiology*, 60(6): 495-502.
- [12] de Vries S, et al. (2003). An exploratory analysis of the relationship between greenspace and health. *Environmental and Planning A*, 35:1717-1731.
- [13] Maas J, et al. (2009). Morbidity is related to a green living environment. *Journal of Epidemiology and Community Health*, 63(12):967-973.
- [14] Nielsen TS, Hansen KB. (2007). Do green areas affect health? Results from a Danish survey on the use of green areas and health indicators. *Health and Place*, 13(4):839-50.
- [15] Mitchell R, Popham F. (2008). Effect of exposure to natural environment on health inequalities. *Lancet*, 372(9650):1655-1660.
- [16] Villeneuve PJ, et al. (2012). A cohort study relating urban green space with mortality in Ontario, Canada. *Environmental Research*, 115:51-8.
- [17] Li Q. (2010). Effect of forest bathing trips on human immune function. *Environmental Health and Preventive Medicine*,15:9-17.
- [18] van den Berg AE, et al. (2010). Green space as a buffer between stressful life events and health. *Social Science and Medicine*,70:1203-1210.
- [19] Centers for Disease Control and Prevention. (2013). Quick Stats. Morbidity and Mortality Weekly Report , 26 (31): 635.
- [20] Kjellgren A, Buhrkall H.(2010). A comparison of the restorative effect of a natural environment with that of a simulated natural environment. *Journal of Environmental Psychology*, 30(4):464-472.
- [21] Fan Y, Das KV, Chen Q. (2011). Neighborhood green, social support, physical activity, and stress. *Health and Place*, 17:1202-1211.
- [22] Mytton OT, et al. (2012). Green space and physical activity: an observational study using Health Survey for England data. *Health Place*, 18(5):1034-41.
- [23] Astell-Burt T, et al. (2013). Green space is associated with walking and moderate-to-vigorous physical activity (MVPA) in middle-to-older-aged adults: findings from 203 883 Australians in the 45 and up study. *British Journal of Sports Medicine*. 2013 Apr 30. [Epub ahead of print].
- [24] Coombes E, et al. (2009). The relationship of physical activity and overweight to objectively measured green space accessibility and use. *Social Science & Medicine*. 2010 Mar;70(6):816-22.
- [25] Rolland Y, et al. (2008). Physical activity and Alzheimer’s Disease: From prevention to therapeutic perspectives. *Journal of the American Medical Directors Association*, 9: 390–405.
- [26] Larson E, et al. (2006). Exercise is associated with reduced risk for incident dementia among persons 65 years of age and older. *Annals of Internal Medicine*,144, 73–81.

- [27] [http://www.eurekalert.org/pub\\_releases/2013-06/cmu-vrr061213.php](http://www.eurekalert.org/pub_releases/2013-06/cmu-vrr061213.php)
- [28] Kaplan R. (2001). The nature of the view from home: Psychological benefits. *Environmental Behavior*; 33(4): 507-542.
- [29] Pretty J, et al. (2005). The mental and physical health outcomes of green exercise. *International Journal of Environmental Health Research*, 15(5):319-37.
- [30] Coon JT, et al. (2011). Does participating in physical activity in outdoor natural environments have a greater effect on physical and mental wellbeing than physical activity indoors? A systematic review. *Environmental Science & Technology*, 45, 1761–1772.
- [31] Berman MG, et al. (2012). Interacting with nature improves cognition and affect for individuals with depression. *Journal of Affective Disorders*, 140(3):300-5.
- [32] Aspinall P, et al. (2013). The urban brain: analysing outdoor physical activity with mobile EEG. *British Journal of Sports Medicine*. [Epub ahead of print].
- [33] Atchley RA, et al (2012). Creativity in the wild: improving creative reasoning through immersion in natural settings. *PLoS One*, 7(12):e51474.
- [34] Stigsdotter U, et al. (2010). Health promoting outdoor environments - Associations between green space, and health, health-related quality of life and stress based on a Danish national representative survey. *Scandinavian Journal of Public Health*, 38: 411.
- [35] Matsuoka R, Sullivan W. (2011). Urban nature: Human psychological and community health. In: Douglas I, Goode D, Houck M, Wang R, eds. *The Routledge Handbook of Urban Ecology*. Abingdon, UK: Routledge; 408-423.
- [36] Bratman GN, et al. (2012). The impacts of nature experience on human cognitive function and mental health. *Annals of the New York Academy of Sciences*, 1249:118-136.
- [37] Kuo FE. (2001). Coping with poverty--impacts of environment and attention in the inner city. *Environment and Behavior*, 33(1):5-34.
- [38] Kuo FE, Sullivan WC. (2001). Aggression and violence in the inner city--effects of environment via mental fatigue. *Environment and Behavior*, 33(4):543-571.
- [39] Thompson C, et al. (2012). More green space is linked to less stress in deprived communities: Evidence from salivary cortisol patterns. *Landscape and Urban Planning*, 105: 221–229.
- [40] Van den berg A, Custers M. (2011). Gardening Promotes Neuroendocrine and affective restoration from stress. *Journal of Health Psychology*, 16(1):3-11.
- [41] Sullivan W, et al. (2004). The Fruit of Urban Nature: Vital Neighborhood Spaces. *Environment and Behavior*, 36(5):678-700.
- [42] Alaimo K, Reischl TM, Ober-Allen J. (2010). Community gardening, neighborhood meetings and social capital. *Journal of Community Psychology*, 38(4):497-514.
- [43] Litt JS, et al. (2011). The influences of social involvement, neighborhood aesthetics and community garden participation on fruit and vegetable consumption. *The American Journal of Public Health*, 101:1466-1473.
- [44] Teig E, et al. (2009). Collective efficacy in Denver, Colorado: Strengthening neighborhoods and health through community gardens. *Health and Place*, 15:1115-1122.
- [45] Comstock N, et al. (2010). Neighborhood attachment and its correlates: Exploring neighborhood conditions, collective efficacy and gardening. *Journal of Environmental Psychology*, 30:435-442.
- [46] U.S. Department of Health and Human Services. (2008). 2008 Physical Activity Guidelines for Americans.



The goal of the **Health & Environment Program** is to advance environmental knowledge among health professionals to improve the public's health with a special emphasis on children and underserved populations.

At the **National Environmental Education Foundation**, we provide knowledge to trusted professionals who, with their credibility, amplify messages to national audiences to solve everyday environmental problems. Together, we generate lasting positive change.

**4301 Connecticut Avenue NW, Suite 160 ✦ Washington, DC 20008 ✦ V 202.833.2933 ✦**  
**Email: [health@neefusa.org](mailto:health@neefusa.org) ✦ [www.neefusa.org/health.htm](http://www.neefusa.org/health.htm)**