



## How Natural and Built Environments Impact Human Health

Research by [Dr. Nancy Wells](#), an environmental psychologist in the Department of Design and Environmental Analysis at Cornell University demonstrates how natural and built environments affect people's mental and physical well-being throughout their lives.

Her research highlights the profound effects that built environments have on public-health. Planning decisions influence neighborhood configuration, housing design, parks, location of stores and schools, as well as factors such as traffic density and air and water quality. These characteristics, in turn, affect physical and psychological health for people of all ages. "Making health an explicit component of planning is critical," Wells explains.

### Planning Should Consider Public Health

Wells along with two colleagues, Gary W. Evans and Yizhao Yang, recently undertook a comprehensive review of research on how planning decisions impact public health (Wells, Evans and Yang, 2010). They found that decisions about factors such as density of communities, presence and size of parks, land-use mix, height and size of residential structures, food store location, and how roads are laid out affect people's physical health and psychological well-being. Most of the major health problems plaguing the U.S. population today—from psychological distress to heart disease to diabetes—have significant environmental causes. Wells argues that, for those reasons, health should be an important consideration in planning decisions.

### Findings from Wells's research review suggested:

Having natural areas nearby promotes well-being. Access to or views of the natural environment improve cognitive functioning and improve recovery from surgery and illness. People who live near parks and open space are more physically active.



*"Making health an explicit component of planning is critical"*

In fact, older, urban residents who have places to walk and access to parks and tree-lined streets live longer. Trees and natural areas may bolster a sense of community by drawing people together and enhancing social connections.

Land-use planning, such as zoning, often influences community attributes such as soil contamination, safety of drinking water, traffic density, and water, air, noise, and light pollution. For example, studies show that noise affects reading skills in children, elevates blood pressure, and increases stress hormones. Residents who live in neighborhoods where they must depend on cars for transportation have reduced physical activity and increased obesity rates.



Planning decisions that influence the location of supermarkets, fast-food eateries, farmers markets, and convenience stores can profoundly affect people's diets and their health. People who live in a neighborhood with a supermarket are more likely to eat the recommended amount of fruits and vegetables. Further, wealthier neighborhoods have more supermarkets than do poorer neighborhoods, and poor communities have more places to buy and drink alcohol.

The characteristics and quality of housing directly affect people's physical and mental health. A home that is cold and damp or has allergens may cause respiratory illnesses and asthma in the residents (Shaw, 2004; Wigle, 2003). The height and size of housing also has health effects on residents—high-rise housing is associated with psychological stress, particularly among low-income mothers of young children (Evans, et al., 2003). Children who lived in 14-story public housing were found to have greater behavioral problems than children living in three-story public housing (Saegert, 1982). Social isolation may be one reason for this, because parents are less likely to let their kids play outside if they live high up in a large building (Kim, 1997). And, finally, crowding has detrimental effects on both mental and physical health (Evans, 2001).

Wells asserts that when many of these risk factors exist together, they are likely to have even stronger impacts on mental and physical health.

In the following two studies conducted by Wells, she explored how the environment promoted or hindered physical exercise, psychological well-being, and cognitive functioning.

#### Neighborhood Design Affects Walking in Unexpected Ways

Rates of inactivity have reached epidemic levels in the United States, putting individuals at risk for obesity and associated health problems. The general expectation is, and previous research has shown, that people who live in mixed-use neighborhoods with sidewalks and shared recreation spaces walk more and, thus, get more daily exercise.

But in a study of how the design of neighborhoods influenced residents' walking, Wells and Yang (2008) found that, to the contrary, women living in so-called "neo-traditional" mixed-use neighborhoods did not walk significantly more than women residing in suburban neighborhoods with large lots, no sidewalks, and no shared recreation space.

Using pedometers to measure steps taken daily, Wells studied 70 low-income women—about 77 percent African American, 17 percent white, and 6 percent Asian, Latina, and Native American—in the southeastern U.S., who relocated to either neo-traditional or suburban neighborhoods through their partnership with a self-help housing program.

The study found, in fact, that residents in mixed-use communities walked less. A possible reason was that the area businesses might not have been pedestrian- or family-friendly, for instance liquor stores or strip clubs. Safety concerns or fear of crime might also deter walking.

Neighborhood design factors that did promote walking were streets laid out in intersecting grids and fewer cul-de-sac (also known as "loops and lollipops" patterns).

Age, income, and body mass index were not significant predictors of walking, although race and household size were associated with how much the women walked.

Further research is needed to better understand these findings. The participants in this study were not randomly selected and the sample was small. The use of pedometers did not allow assessment of where and why people were walking. And finer-grained environmental measures would give more information about neighborhood characteristics.

#### Nature Buffers Stress in Rural Children

Although the natural environment's effect on the mental health of adults has been well documented, Wells suspected that nature's moderating influence on stress might be even stronger in children. Her research has shown that having nature close to a home protects the psychological well-being of children. And the impact is strongest for children with the highest levels of stressful life events. In addition, having green space around the home boosts their cognitive functioning.

In a study of 337 children in five rural upstate New York communities in grades 3 through 5, Wells and Evans (2003) found that the impact of life stress and adversity was lower among children who lived close to nature and vegetation than among those with little access to natural settings. To gauge how the children were dealing with stress, Wells used parents' reports of their children's psychological distress and children's own ratings of their feelings of self-worth, using standard measurement tools.

Many studies have shown children's affinity for nature. It follows, then, if people tend to prefer environments in which they function most effectively, natural settings would promote children's well-being. And that is exactly what Wells found.

Not only did the study reveal that nearby nature buffers the impact of stress on children and promotes their resilience, it suggested that higher levels of access to nature had an even greater buffering effect for children dealing with stressful life events. The buffering effect was greatest for the most vulnerable children—those experiencing the greatest life stress, such as family relocation, or being picked on or punished at school.

Wells speculates that in urban areas, where the amount of green space is more variable, the moderating effects of nature on children's stress would be even stronger.

Wells gives one possible explanation for nature's protective effect: green spaces foster social interaction and thereby promote social support. For example, research shows that children and parents who live in places that allow for outdoor access have twice as many friends as those who have less outdoor access due to traffic, according to a 1995 study by M. Huttenmoser.

Another explanation is that exposure to natural elements helps people to focus their attention, as found by other researchers. While in nature, an individual no longer needs to block out noise and other mental intrusions, allowing their mind to rest (R. Kaplan and S. Kaplan, 1989; S. Kaplan, 1995; S. Kaplan and R. Kaplan, 1983). Being away from the stress of day-to-day problems gives a person a mental vacation. And the vastness of the environment immerses a person in a mentally comfortable setting. Thus, nature may help children to think more clearly and cope more effectively with life stress.

Research by Wells and her colleagues answers some questions and opens the door on many more, exploring the role nature plays throughout our lives. Overall, the evidence is clear that the built environment - housing, urban development, land use, and transportation - has profound effects on our health and well-being. Planning decisions should take into consideration these public health impacts and the evidence supporting them.

#### What Individuals Can Do:

- Give children plenty of opportunities to play outside in natural settings.
- Landscape your yard to enhance natural window views.
- Position your child's (and your) desk to face a natural window view.
- Take family outings to natural areas.
- If possible, choose a house or apartment with access to nearby nature or at least views of nature.
- Walk more and increase outdoor physical activity.

#### What Citizens Can Ask Planners to Do:

- Consider health implications and employ evidence when making planning decisions.
- Plan space for parks and natural areas in residential areas.
- Keep building heights low.
- Build child care centers, schools, nursing homes, and hospitals in natural settings.
- Landscape existing child care centers, schools, nursing homes, and hospitals with as many natural elements as possible.
- Plan new neighborhoods with walkable, intersecting streets rather than "loops and lollipops" patterns.

#### Further Resources:

##### Websites

Active Living Research, Robert Wood Johnson Foundation:  
<http://www.activelivingresearch.org>

Public Health Law and Policy:  
<http://www.phlpnet.org/healthy-planning>

Health Impact Assessment, Centers for Disease Control and Prevention: <http://www.cdc.gov/healthyplaces/hia.htm>

Health Impact Assessment, World Health Organization (WHO): <http://www.who.int/hia/en>

## Books

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