



# Green strategies to improve public health and save billions

There are some things you cannot put a price on – but social scientists at the **University of Washington** led by **Dr Kathleen Wolf** are working hard to demonstrate that green infrastructure and urban landscapes have incredible public value

**THROUGHOUT HUMAN HISTORY**, the efficient planning of settlements where large numbers of people can live side-by-side has become progressively harder. When cities like London and New York were first established, their locations were chosen simply because certain natural resources were available nearby, and they facilitated industries, transport or agriculture. Today, this human dependence on nature’s products and processes has been termed ‘ecosystem services’.

Over the centuries, city planning and management has become much more complex, due in part to population growth, greater demand for essential goods and services and the need for more infrastructure. For example, in the age of the ‘sanitary’ city, which arose in response to industrialization and during which the global population boomed, important technologies were developed to manage and move around essential materials and efficiently dispose of wastes. These efforts reduced disease and illness, improving

communities’ hygiene, as pipes, drains, wires and concrete streamlined the movement of materials and people.

We are now in the age of the ‘sustainable’ city, in which experts are calling for nature and ecological processes to be reintegrated with built systems to address major urban challenges such as stormwater management, waste reduction, air and water quality and energy needs. Green infrastructure strategies can include bioswales, trees and the urban forest, green roofs and walls, green streets and parks networks, among many others.

Public investments in green infrastructure innovations are increasing rapidly, and green systems offer other benefit opportunities. Public health officials watch with alarm as obesity rates, asthma, respiratory and cardiac disease, and depression become more prevalent in their cities and place ever greater burden on their health care systems. Rarely considered as a solution, nearly 40 years of

research evidence shows that nature in the city contributes to many positive health outcomes, and in surprising ways.

### GOING GREEN FOR HEALTH

Decision makers generally address problems using quantitative markers – be it a new investment, such as a treatment plant, or ongoing costs, such as policing or garbage removal. Professionals will examine both costs and benefits to make budget decisions for the public good. However, the public health benefits of having parks, gardens and open spaces in the city are often not easy to measure, making it hard to compare them in numerical terms to more traditional city services.

One research group, however, has been working for some time to put bring the message of ‘metro nature’ benefits to local policy makers and level the playing field for green development. Dr Kathleen Wolf has been investigating the human dimensions of urban greening and urban forestry for more than 20

**OBJECTIVES**

- To share a web-based tool – Green Cities: Good Health (GCGH) – so that professionals, elected officials and concerned citizens can learn more about the science of nearby nature experiences in cities and the relationship to human health benefits
- To convert the health findings of GCGH to national US economic valuations

**KEY COLLABORATOR**

**Dr Stephen C Grado, Professor**, Mississippi State University, College of Forest Resources, USA

**PARTNERS**

**US Department of Agriculture (USDA) Forest Service, Pacific Northwest Research Station • National Urban and Community Forestry Advisory Council, USA**

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**DR KATHLEEN L WOLF** is a Research Social Scientist with the College of the Environment at the University of Washington (Seattle) and is also a research associate with the Pacific Northwest Research Station, USDA Forest Service. Her research focus is the human dimensions of urban forestry and urban ecosystems. She is also interested in the translation of scientific evidence for use in local government policy and planning.

years, and today, with her colleagues, leads efforts at the University of Washington, USA, to quantify the human health and economic benefits of greening programs in cities. She and her team have undertaken a comprehensive literature review of studies concerning the impact of nature and natural spaces on urban life. This indispensable resource for city planning is available on the internet as the Green Cities: Good Health (GCGH) project.

**THE ONE-STOP SHOP**

During the two decades Wolf has been active in the fields of social science and urban forestry, science has shared new discoveries about the benefits that nature provides to citizens. Studies from an international science community document diverse human benefits as people have access to nearby nature in cities. Positive outcomes include improvements in infant birthweight, school performance, workplace satisfaction and cognitive performance in later life. "The reports and articles are distributed across many disciplines – geography, psychology, anthropology, public health, epidemiology, urban forestry, urban planning and more," Wolf explains, illustrating why urban planning officials may not readily be able to find this important information.

Visit Green Cities: Good Health website for more information about metro nature and public health benefits:

[www.greenhealth.washington.edu](http://www.greenhealth.washington.edu)

The GCGH web resource collects conclusions from more than 3,500 publications and summarizes them by a dozen topics, providing a one-stop shop to learn about these important discoveries. For example, under 'Crime and Public Safety', research reveals that inhabitants of public housing buildings having greater amounts of vegetation experienced less crime than those in buildings with less vegetation – reporting 52 per cent fewer crimes overall, and within this, 56 per cent fewer violent crimes. Moreover, across 'Local Economics', 'Active Living', 'Healing and Therapy' and a variety of other categories, GCGH provides fully cited facts on urban greening to users in a narrative structure that is easy to follow.

**NEXT STEPS**

The next stage for the project is to engage with people who make a difference in their communities. Efforts are underway to build traffic to the web portal, and to share it widely with city planners, policy makers and decision makers to support local investments in metro nature. The project group is also giving conference presentations and webinar talks at the national and regional

level to share their work. Moreover, the US Department of Agriculture (USDA) Forest Service, which provided project funding, has also enthusiastically provided Wolf and her collaborators with options for disseminating the tool. They are now exploring how to translate the research into assessment tools that can be used to measure city green and public health benefits.

**CRUNCHING THE NUMBERS**

Wolf's team is also keen to expand upon its findings, acknowledging the frequent news headlines about rising costs of healthcare and widespread epidemics of expensive chronic diseases. "We started to recognize the potential cost implications of having nearby nature in cities, and we found that surprisingly little economic analysis has been done to date," Wolf notes. "We now have the evidence that metro nature can be a partial solution to some major challenges that confront nations all around the world."

The social scientists recently joined forces with innovative natural resources economists to drill down and monetize certain metro nature benefits and services. Working with co-investigator Professor Stephen Grado of Mississippi State University, Wolf and her colleagues found that the process of translating such benefits into accurate economic equivalents is very challenging. The researchers were surprised to discover that few of their fellow investigators are measuring actual economic returns.

The interdisciplinary team has risen to the challenge and started its work by screening the GCGH database for valuation prospects, narrowing down the list of health benefits to determine the findings that are most robust. They identified six situations that span the human lifecycle: birth weight, attention deficit hyperactivity disorder, school performance, community crime, cardiovascular disease and Alzheimer's disease. Although the findings are preliminary, they may well play an important role in community and regional planning for green infrastructure. The results indicate positive economic outcomes running into billions of dollars annually – high figures, but perhaps not surprising in light of the total bills presented by public health problems.

**IT'S ONLY NATURAL**

Most people would agree that green spaces, urban plants and natural features in general are pleasant enough to have around, but as the GCGH project and its sequels have demonstrated, metro nature is more than just nice to have – it is profoundly important and valuable. As Wolf concludes: "My hope is that GCGH and our economic findings will compel city leaders to recognize that having high quality, nearby nature in cities is absolutely essential for human health and wellness".

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