Urban forestry project ties residential nature to health care spending

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A new project led by University of Illinois recreation, sport and tourism professor Matthew Browning will document the health care cost savings associated with nature in residential settings. Browning and his project partners aim to develop a GIS-based modeling tool for use by city arborists across the U.S. that they can use to estimate their communities' potential rate of return on investments in urban forestry. Credit: L. Brian Stauffer

A hearty dose of Mother Nature may be an effective antidote for many physical and psychological ailments, several studies have suggested. However, no one has calculated how much green - as in dollars - nature's greenery saves on health care costs.

A new research project intends to do just that: explore how urban forestry affects health care spending, and then build a free online modeling tool city arborists can use to estimate their communities' potential rate of return on their investments in parks and other natural elements.

The three-year project is led by University of Illinois recreation, sport and tourism professor Matthew Browning. Major collaborators include Ming Kuo, a professor of natural resources and environmental sciences and director of the Landscape and Human Health Laboratory at Illinois; senior epidemiologist Stephen Van Den Eeden of the Kaiser Permanente Northern California Division of Research; and Jonathan Greenberg, professor of natural resources and environmental science at the University of Nevada, Reno.

The $647,000 project includes more than $278,000 from a U.S. Forest Service National Urban and Community Forestry Challenge Cost-Share Grant, in-kind support from the U. of I. and 16 project partners, and a small grant from the Midwest Big Data Hub.

Given the skyrocketing costs of health care in the U.S., the project is timely because it will document urban forestry's potential as a low-cost, effective and politically popular means of reducing health care costs, Browning said.

"While a number of studies suggest that exposure to nature improves people's health and well-being, nobody has ever calculated a return on cities' investments in urban forestry. Our study will be the first to look at

tree plantings and parks, and how much people spent on health care before and after those greening effects," said Browning, who also is the health and nature lead researcher for the Parks and Environmental Behavior Research Group at Illinois.

The study will examine how urban green space is related to health expenditures among more than 4 million members of Kaiser Permanente Northern California, which maintains health utilization and cost data in its comprehensive electronic medical records.

"The Kaiser Permanente setting provides a unique opportunity to test this relationship, given the detailed longitudinal health data available," Van Den Eeden said.

The member data maintained by Kaiser Permanente will enable the researchers to examine whether health care expenditures decline after communities invest in urban forestry and how these expenditures change when people move to greener or less green neighborhoods, according to the project description.

Many of the studies on the health impact of urban forestry were conducted in regions with cold, inhospitable climates, and little of that research focused on underserved communities, according to the researchers on the current project.

"As such, the impacts of the urban forest on health outcomes are likely independent - or at most only partially mediated - by the extent to which a region's climate is favorable to people going outside and recreating," Browning and his co-authors wrote.

The study's geographic area encompasses 80,000 square miles in northern California and "is representative of more climates than almost any other area that could be studied," according to the project

description. The population in the area being studied is equally diverse: About half of the 7 million inhabitants are black, Latino or from other ethnic groups.

"And income varies all over the map," Kuo said. "One of the great opportunities that the Kaiser Permanente data give us is the chance to examine the impacts of residential greenness on low-, medium- and high-income neighborhoods."

The region will be mapped in 3-D and its urban forestry categorized by type (such as yards with trees or overgrown, wooded areas) and by trait (such as tree canopy density and shape) to identify which characteristics and settings are associated with the greatest health care savings.

Two nonprofit partners, Friends of the Urban Forest and California ReLeaf, will provide the cost data for the region's urban forestry so the researchers - and ultimately city arborists across the U.S. and beyond - can estimate the costs of designing, planting and maintaining these structures in other residential surroundings.

The findings will be used to generate a free open-source modeling tool using the InVEST (Integrated Valuation of Environmental Services and Tradeoffs) platform, developed by the Natural Capital Project. Translating the findings into a free online modeling tool will make the research accessible to a broader audience of urban planners, designers and city leaders.

The National Wildlife Federation, a consultant on the project, will help lead efforts to communicate the findings to policymakers, the public and other audiences.

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