Researchers link urban green and blue spaces to less coronary artery calcification

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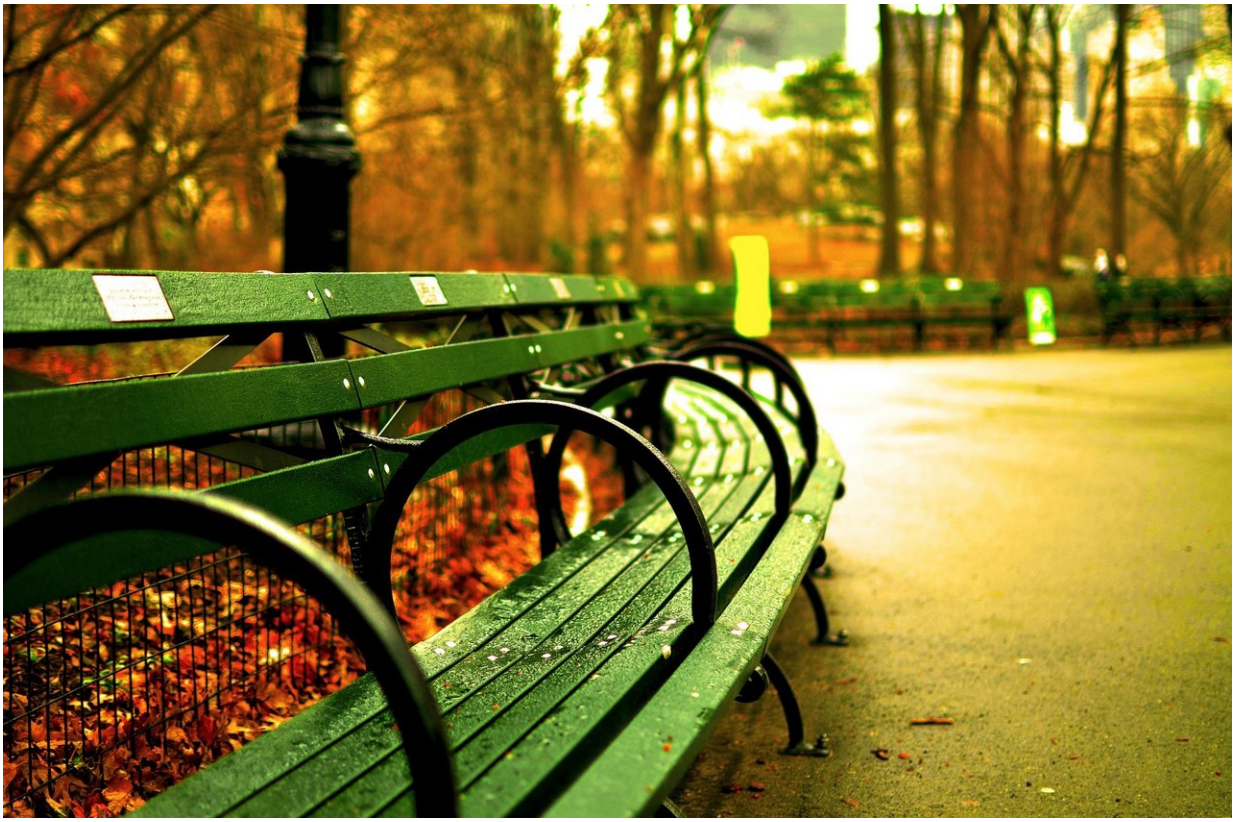

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Being near and having more exposure to urban green space and blue (water) space is linked to lower odds of having coronary artery calcification in middle age, which is an early marker of cardiovascular

disease.

The associations were more pronounced among Black individuals and those living in neighborhoods with lower socioeconomic status, with the strongest effects observed in Black individuals in economically deprived neighborhoods.

Specifically, Black participants with the highest accessibility to a river had 32% lower odds of coronary artery calcification compared to those with the lowest accessibility. Black participants with greater access to green spaces had up to 35% lower odds of calcification. For each 10%-point increase in green space, the odds of having coronary artery calcification decreased by 15% on average.

The study was published today June 27 *Circulation*.

Coronary artery calcification (CAC) is when calcium builds up in the plaque found in the walls of the coronary arteries. It can be a sign of early coronary artery disease, which can cause a heart attack.

"The protective effect of having access to urban blue and green spaces with coronary artery calcification highlighted in our study underscore the potential benefits of such infrastructure, particularly for underserved populations at higher risk for cardiovascular disease," said corresponding author Dr. Lifang Hou, a professor of preventive medicine at Northwestern University Feinberg School of Medicine.

"Our findings provide quantitative evidence supporting environmental policies to enhance the accessibility and quality of residential blue and green spaces, which can promote public health benefit and address racial and neighborhood-related health disparities."

Why do green and blue spaces improve health?

"Having more green and blue spaces may provide increased opportunities for physical activities, social interactions, stress relief and restoration, all of which have been linked to improved metabolic and cardiovascular health," Hou said.

"Additionally, exposure to green and blue spaces has been shown to boost people's immune system, reduce chronic inflammation and slow down the biological aging process, all of which are biologically important in people's overall health and cardiovascular health. More studies are needed to fully understand the role of urban natural environments in pathways related to human health."

Conversely, the study also showed shorter distances to parks were associated with higher odds of CAC in these neighborhoods, with individuals having the highest park accessibility showing 29% higher odds of CAC compared to those with the lowest accessibility.

"The poor condition of parks and/or safety concerns in underserved urban neighborhoods might deter park use and prevent residents from fully benefiting from these spaces," said study first author Kyeezu Kim, adjunct assistant professor of preventive medicine at Feinberg and assistant professor at Sungkyunkwan University School of Medicine in South Korea.

"From a public health perspective, the results suggest the need for quality control and management of the surrounding environment in neighborhoods with disadvantaged social determinants of health. More data is warranted to fully explain this observation."

How the study was conducted

The study included 2,960 Black and white men and women (average age

of 50 years) from Birmingham, Ala., Chicago, Ill., Minneapolis, Minn., and Oakland, Calif., who were followed for 25 years (from 1985–1986 to 2010–2011). While proximity to urban blue and green spaces has been linked to better cardiovascular health, few studies have examined the role of social determinants of health, such as race and neighborhoods with lower socioeconomic status in these associations, particularly with long-term observational data.

Data for this study were drawn from the Coronary Artery Risk Development in Young Adults (CARDIA) study, a multi-center prospective cohort study across four urban cities in the U.S. The CARDIA study began in 1985–1986 with 5,115 self-reported Black and white individuals in early adulthood (mean age 24.8).

For blue and green spaces, researchers included percent blue space cover, distance to the nearest river, percent green space cover and distance to the nearest major park within 5 km of the participants' residential addresses. The presence of CAC was measured using a CT (computed tomography) scan when participants were about 50 years old. Researchers examined the associations between each blue and green space and CAC by race and neighborhood socioeconomic status.

More information: Kyeezu Kim et al, Associations of Urban Blue and Green Spaces With Coronary Artery Calcification in Black Individuals and Disadvantaged Neighborhoods, *Circulation* (2024). DOI: 10.1161/CIRCULATIONAHA.123.067992

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