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*Institute of Politics Policy Program
Health Spring Policy Team*

**Greener Places, Healthy Spaces:
A Novel Preventative Method to Reduce Breast Cancer Risk**

Prepared for:

CDC Advisory Committee on Breast Cancer in Young Women
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The Institute of Politics is a nonprofit organization located in the John F. Kennedy School of Government at Harvard University. It is a living memorial to President John F. Kennedy, and its mission is to unite and engage students, particularly undergraduates, with academics, politicians, activists, and policymakers on a nonpartisan basis and to stimulate and nurture their interest in public service and leadership. The Institute strives to promote greater understanding and cooperation between the academic world and the world of politics and public affairs. Led by a Director, Senior Advisory Board, Student Advisory Committee, and staff, the Institute provides wide-ranging opportunities for both Harvard students and the general public. This report is the result of a semester-long intensive effort by a team of undergraduates. The Institute of Politics does not endorse specific policy positions; accordingly, all views expressed in this publication should be understood to be solely those of the authors.

ABOUT THE CENTER FOR DISEASE CONTROL (CDC) ADVISORY COMMITTEE ON BREAST CANCER IN YOUNG WOMEN

The CDC established an Advisory Committee on Breast Cancer in Young Women (ACBCYW), a federal advisory committee, in response to the Education and Awareness Requires Learning Young (EARLY) Act, section 10413 of the Patient Protection and Affordable Care Act (Public Law 111-148).

With the ACBCYW, the CDC works to develop initiatives to increase knowledge of breast cancer, particularly among women younger than 40. Through prevention research and public and professional education, the ACBCYW advances understanding and awareness of breast cancer nationally.

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Overview

This policy brief aims to address the social determinants of health that increase a person's risk of getting cancer, specifically by examining the relationship between tree canopies, greenspace, and cancer outcomes. Access to greenspace is an important factor in reducing cancer risk and improving cancer outcomes, but historical redlining has created inequities in access to greenspace in certain neighborhoods.

The policy brief focuses on identifying which states have legislation allocating funding for greenspace development and preservation in historically redlined neighborhoods, which agencies are receiving that funding, and providing targeted policy recommendations for the CDC to address these inequities.

Through research and analysis, we identified several states and initiatives that have successfully allocated funding for greenspace development and preservation in historically redlined neighborhoods. These examples highlight the importance of partnerships between government agencies, community organizations, and private stakeholders in promoting equity and improving health outcomes in underserved communities.

To address these inequities, we recommend that the CDC should continue to support initiatives that promote the development and preservation of greenspace in historically redlined neighborhoods, allocate funding to support the implementation of these initiatives, and educate the public regarding strategies to address these disparities. We also recommend that the CDC should work with community organizations and local stakeholders to raise awareness of the importance of greenspace for cancer prevention and promote the development of community-led initiatives to address these inequities.

Overall, this policy brief provides targeted policy recommendations for the CDC to address inequities in access to greenspace and promote cancer prevention in historically redlined neighborhoods.

Executive Summary

Access to greenspace is crucial in reducing cancer risk and improving cancer outcomes, but historical redlining has created inequities in access to greenspace in certain neighborhoods. To address this issue, the policy brief aims to identify which states have legislation allocating funding for greenspace development and preservation in historically redlined neighborhoods, which agencies are receiving that funding, and provide targeted policy recommendations for the CDC to address these inequities.

The policy brief will include unique benefits that come from trees, such as their ability to absorb harmful pollutants and provide shade. It will also look at federal funding opportunities for greenspace development, specifically funding related to tree canopies, and identify the federal agencies that distribute those funds. The Cancer Control Program grant recipients will be encouraged to connect with other units in their states that are doing work on trees or greenspace.

The policy brief will highlight the impact of old laws, city laws, and redlining on green spaces and park equity. It will also look at different methodologies for explaining park equity and tree equity, such as tree equity scores, and explore how different communities could use green spaces based on their specific needs.

Success stories and case studies will be included to show the immediate and long-term impacts of greenspace on cancer prevention. The brief will dispel myths about the relationship between greenspace and cancer risk, and provide information on how to address common doubts.

CDC employees will be educated about the impact of greenspace on community health and the options available to address disparities in access to greenspace. A broad overview of legislative opportunities will be provided, and an additional one pager will be developed to highlight the most important legislation.

The policy brief will inform a CDC communications plan to educate partners and policymakers about the importance of greenspace in reducing cancer risk and improving cancer outcomes. The findings from the brief will also inform future work by the CDC to address the role of structural and institutional racism in health outcomes.

Recommendations

1. Establish Green Space Equity Zones

The CDC should work with local governments and community organizations to identify and designate Green Space Equity Zones in historically redlined neighborhoods and areas facing disparities in greenspace access. These zones should prioritize the allocation of funding and resources for the development and maintenance of green spaces, including the planting and preservation of tree canopies. By targeting specific areas with the greatest need, the CDC can ensure that underserved communities have equitable access to greenspaces that promote cancer prevention and improved health outcomes.

2. Develop Collaborative Funding Programs

The CDC should collaborate with federal agencies and private foundations to establish dedicated funding programs that specifically support greenspace development and preservation in communities impacted by historical redlining. These programs should provide grants and financial incentives for local governments, nonprofit organizations, and community groups to undertake projects that enhance greenspace availability and quality. By leveraging partnerships and funding opportunities, the CDC can accelerate efforts to address inequities and promote the integration of greenspaces into cancer prevention strategies.

3. Enhance Green Space Health Messaging

The CDC should develop targeted health messaging campaigns that emphasize the link between green spaces, cancer risk reduction, and overall well-being. These campaigns should be tailored to reach populations in historically redlined neighborhoods and other underserved communities. Collaborate with local health departments, community health centers, and community-based organizations to disseminate information through culturally appropriate channels, such as community events, local media outlets, and social media platforms. The messaging should highlight the benefits of greenspaces in preventing cancer and improving health outcomes, while addressing specific concerns and misconceptions.

4. Foster Cross-Sector Collaboration

The CDC should facilitate partnerships and collaborations between health agencies, urban planning departments, environmental organizations, and community advocacy groups to integrate greenspace initiatives into broader community development efforts. Encourage joint planning and policy-making processes that promote the inclusion of greenspaces in urban design, land-use planning, and infrastructure projects. By fostering cross-sector collaboration, the CDC can leverage diverse expertise and resources to ensure that greenspace considerations are integrated into decision-making processes at multiple levels.

5. Support Community-Led Initiatives

The CDC should provide support and technical assistance to community-led initiatives that focus on greenspace development and preservation. Establish a grant program specifically aimed at empowering grassroots organizations and community groups to lead efforts in creating and maintaining greenspaces. This support should include capacity-building, training, and resources to enable local communities to drive sustainable change in their neighborhoods. By empowering communities, the CDC can ensure that greenspace interventions are tailored to local needs and aspirations, fostering a sense of ownership and long-term sustainability.

6. Educate Around State-Level Legislation for Greenspace Development and Preservation

The CDC should use education to raise awareness for the passage of state-level legislation that allocates funding for greenspace development and preservation, particularly in historically redlined neighborhoods. For example, the CDC can work with state policymakers in California to educate around Assembly Bill 1276, which establishes a grant program for urban greening projects in disadvantaged communities. By providing technical expertise on such legislation, the CDC can contribute to creating legal frameworks that prioritize greenspace equity and cancer prevention.

7. Promote Funding Transparency and Accountability

The CDC should collaborate with federal agencies, such as the Department of Housing and Urban Development (HUD) and the Environmental Protection Agency (EPA), to identify and track funding allocations for greenspace projects. This includes analyzing recent federal grants and funding opportunities related to greenspace

development and tree canopy preservation. By examining funding flows from federal agencies to states and local jurisdictions, the CDC can identify potential partners for raising awareness about the relationship between greenspaces and cancer prevention.

8. Highlight Successful Case Studies and Best Practices

The CDC should compile and disseminate case studies and best practices from cities and states that have successfully implemented greenspace initiatives to reduce cancer risk and improve health outcomes. For instance, the CDC can showcase the Tree Equity Score methodology employed by Atlanta City leaders to guide greenspace planning decisions in underserved communities. Additionally, the CDC can feature success stories from cities like Boston, where grassroots organizations like "Speak for the Trees" have actively engaged neighborhoods in tree planting efforts. By sharing these examples, the CDC can inspire and inform policymakers and communities about effective strategies for achieving greenspace equity.

9. Collaborate with Key Partners in the Greenspace Sector

The CDC should engage with relevant organizations and agencies working in the greenspace sector to leverage their expertise and resources. For example, the CDC can collaborate with the American Forests, a leading organization dedicated to promoting tree planting and preservation, to develop joint initiatives that integrate greenspace considerations into cancer prevention strategies. Additionally, partnering with urban planning departments, local land trusts, and community health centers can facilitate the integration of greenspace goals into community development plans and healthcare initiatives.

10. Engage in Knowledge Exchange and Training Programs

The CDC should facilitate knowledge exchange and training programs that enhance the capacity of local health departments, community organizations, and policymakers to understand and address the link between greenspaces, cancer risk, and health disparities. This can include organizing webinars, workshops, and conferences where experts and practitioners share evidence-based strategies and practical tools for integrating greenspace initiatives into public health programs. By building the knowledge and skills of stakeholders, the CDC can foster a collective understanding and commitment to addressing greenspace inequities and promoting cancer prevention.

By implementing these policy recommendations, the CDC can contribute to advancing greenspace initiatives that reduce cancer risk and promote health equity. These recommendations involve educating around state-level legislation, analyzing funding opportunities, showcasing successful case studies, collaborating with key partners, and supporting knowledge exchange programs. Through targeted actions, the CDC can drive tangible change in addressing the social determinants of health and promoting equitable access to greenspaces.

Relationship Between Greenspaces and Medical Outcomes

Researching the scientific relationship between greenspace and cancer outcomes

Overview of Key Relevant Research

Evidence for the association between greenspace exposure and cancer incidence is not overwhelming, suffering from insufficient study. Yet while existing research has not yet demonstrated a strong relationship between public greenspaces and cancer incidence, current literature suggests a much stronger association with improved health outcomes more generally. Through a brief literature review on the subject, we will offer a high-level summary of the current understanding of greenspace health associations.

Breast, Lung, and Prostate Cancer

A 2022 meta-analysis and systematic review of relevant research failed to find statistically significant associations between greenspaces and breast, lung, or prostate cancer, and failed to draw any conclusions about other cancers.¹ Yet, the researchers emphasized the low quality of existing evidence, warning that they could not draw strong conclusions. An alternative 2021 study following nearly 20,000 individuals over 27 years found evidence that greenspaces reduce the risk of breast cancer, yet at the same time their study suggested that proximity to agricultural lands, greenspaces, and forestry were actually associated with a marginally “increased risk of all-site cancer.”²

Broader Health Implications of Greenspaces

Researchers have found some compelling evidence that greenspaces are beneficial to health more generally. A recent review focusing on the broader health implications of greenspaces found that they were associated with improvements in cardiovascular health and inflammation.³ Noting the link between cardiovascular health and cancer outcomes, the researchers found reason to be optimistic. Citing other systemic reviews that found beneficial associations between greenspaces and mental health and well-being, it seems greenspaces offer some compelling benefits. Discussion in this review noted that reduced air pollution, improved social environments, and better psychological factors would likely be associated with positive cancer-related outcomes, yet warned once more of the lack of strong research in this area. This conclusion is backed by a 2018 meta-study that considered 143 published studies, finding significant reductions in blood pressure, heart rate, diabetes incidence, and cardiovascular mortality.⁴ Yet once again, the authors warned of a large number of poor studies and studies with unacceptably high heterogeneity.

¹ “Exposure to Greenspace and Cancer Incidence, Prevalence, and Mortality.”

² “Greenspace Exposure and Cancer Incidence.”

³ Bikomeye et al., “Greenspace, Inflammation, Cardiovascular Health, and Cancer.”

⁴ “The Health Benefits of the Great Outdoors.”

Conclusion

Considering the body of available research, it seems that greenspaces are associated with a number of health benefits, yet the link to cancer incidence remains elusive. This is an area ripe for research, and while current evidence suffers some weaknesses, it seems strong enough to suggest that increased access to greenspaces is a deserving cause.

Redlining

Researching the history of redlining practices and their impact on green space availability in disadvantaged communities

Effect of Historical Redlining on Greenspace Access

Nationwide housing shortages and existing anti-Black sentiments led to United States initiatives aiming to segregate neighborhoods by race.⁵ White middle to lower-class families were encouraged to live in the suburbs, whereas Black people were directed towards urban areas – areas perceived as less desirable. The Federal Housing Administration in 1934 refused to insure mortgages in and around African American neighborhoods, a practice known as redlining. Maps were created by the Home Owners Loan Corp in the New Deal and then color-coded to indicate areas deemed too risky for loans; a practice which essentially prevented insurance for predominantly Black areas.⁶ Subsidies were given to builders to create large-scale White subdivisions that excluded African Americans. The underwriting manual explicitly stated that incompatible racial groups should not live in the same communities.

This segregation led to over-policing in urban areas, income inequality, and a distinct lack of upward mobility for Black Americans and other Americans of color. Overall African American wealth continues to be much lower than their family income would suggest due to the lack of generational home ownership. Furthermore, there is a distinct lack of greenspace access in urban areas compared to suburbs, with African Americans disproportionately affected. This lack of access to greenspace has led to a plethora of negative health impacts.

Repercussions of Greenspace Inaccessibility on Health Outcomes

The poverty and economic inequality produced by redlining has been documented to produce direct impacts on health outcomes – from birth weight to premature mortality to cancer development.⁷ Decreased tree canopy coverage and worsened levels of air pollution in particular have an outsized effect on the presence of cancer in a community, particularly lung cancer; both of these phenomena are associated with the impervious surfaces and lack of tree canopies in the

⁵ “When Health Disparities Hit Home: Redlining Practices, Air Pollution, and Asthma”

⁶ “Walking on a Redline: Did Discriminatory U.S. Housing Policies Affect Greenspace Development?”

⁷ “Redlines and Greenspace: The Relationship between Historical Redlining and 2010 Greenspace across the United States”

primarily non-white neighborhoods created by redlining practices.⁸ The combinatorial effects of a dearth of access to greenspace, related pollutants and physical inactivity, and a lack of sufficient and easily accessible healthcare in historically redlined neighborhoods means that cancer incidence is higher in predominantly Black urban areas. Despite this, there is a discrepancy between exposure to cancer risk factors and actual cancer diagnosis: frequently, diagnosis takes place at a significantly later stage in Black patients, causing worse health outcomes in comparison to White Americans from non-minority neighborhoods.⁹

Redlining Reversal and Resulting Health Outcomes

Multiple pieces of legislation have been passed at both the national and state level in an attempt to reverse the impacts of redlining and discriminatory housing practices. Redlining practices don't just include refusing to sell a property to a minority, they also include changing the conditions of rentals, separate facilities and services, unfair evictions, harassment, delaying repairs, etc. Nationally, the Fair Housing Act of 1968 was passed to prevent discrimination during housing purchases and transactions. This act prohibits housing discrimination based on race, color, national origin, religion, sex, gender identity, familial status, and disability.¹⁰

In the 50 years since the passage of the Fair Housing Act, changes have been made but the impacts of redlining still persist economically and socially. Two-thirds of hazardous neighborhoods are inhabited by mainly minorities. In a report by the Center for Investigative Reporting, 61 metro areas showed evidence of redlining¹¹. These continued practices have a heavy impact on health. Redlining is linked with an increased risk of diabetes, hypertension, heart disease possibly through decreased economic opportunity leading to a lower standard of living¹².

⁸ “Association of historic redlining and present-day health in Baltimore”

⁹ “Cancer Stage at Diagnosis, Historical Redlining, and Current Neighborhood Characteristics: Breast, Cervical, Lung, and Colorectal Cancers, Massachusetts, 2001–2015”

¹⁰ “Housing Discrimination Under the Fair Housing Act”

¹¹ “Redlining was banned 50 years ago. It's still hurting minorities today”

¹² “Modern Day Consequences of Historic Redlining: Finding a Path Forward”

Federal & State Legislation

Researching state legislation related to green space development and/or preservation, particularly in disadvantaged communities

National Trends in the Legislative Landscape

Public greenspace development has been the target of legislation on both the federal and, more recently, state level.

Legislation that promotes the development of public parks, trails, gardens, plazas, etc. dates back centuries.¹⁰ The significance of ensuring access to greenspaces, such as parks, gardens, and other natural areas, for the health and wellbeing of residents has gained considerable attention which can be gleaned from the growing trend toward creating more greenspaces in urban areas.¹¹ The passage of the 2022 Bipartisan Infrastructure Law and Inflation Reduction Act exemplified a revitalized federal endorsement for the promotion and development of green spaces and parks. Under the Inflation Reduction Act (IRA) of 2022, substantial financial provisions of \$300 billion were designated to provide incentives, grants, and loans for the purpose of supporting new infrastructure investments in clean energy, transportation, and environmental initiatives.¹²

State and local governments have also passed their own laws and regulations regarding public greenspaces. For example, the city of Los Angeles has passed several pieces of legislation aimed at increasing access to parks and green spaces in low-income communities of color that were historically redlined. These efforts include the 50 Parks Initiative, which aims to provide 50 new parks in underserved neighborhoods across the city.¹³ The parks are intended to be small and are equipped with playground and exercise equipment with the the goals of increasing neighborhood social contact and fitness opportunities. In a 2014 analysis conducted of 18 parks constructed a year earlier (in 2013), it was found that women and children were the primary users of these parks, an important finding for green spaces as an implementation for breast cancer reduction.¹⁴ Similarly, in Seattle, the city council passed an ordinance in 2020 that requires the city to prioritize parks and open space investments in historically underinvested communities, including those that were redlined.¹⁵ More general local greenspace legislation

¹⁰ Schultz, Courtney L., Robby Layton, Michael B. Edwards, Jason N. Bocarro, Roger L. Moore, Stephanie Tepperberg, Attila Bality, and Myron F. Floyd. 2016. "Potential Measures for Linking Park and Trail Systems to Public Health." *Journal of Park and Recreation Administration*. 34 (1): 4-23

¹¹ Nguyen, P. Y., Astell-Burt, T., Rahimi-Ardabili, H., & Feng, X. (2021). Green Space Quality and Health: A Systematic Review. *International journal of environmental research and public health*, 18(21), 11028. <https://doi.org/10.3390/ijerph182111028>

¹² Niazi S. K. (2022). The Inflation Reduction Act: A boon for the generic and biosimilar industry. *Journal of clinical pharmacy and therapeutics*, 47(11), 1738–1751. <https://doi.org/10.1111/jcpt.13783>

¹³ "About | 50 Parks | City of Los Angeles Recreation and Parks." Accessed June 17, 2023. <https://www.laparks.org/50parks/>.

¹⁴ Ferguson, Patrick, Xiangyi Jing, Katelyn Leenhouts, and Hannah Woo. "The Los Angeles Parks Foundation: A Study of the 50 Parks Initiative," 2014.

¹⁵ Trust for Public Land. "The Trust For Public Land & New York City Unveil State-Of-The-Art Green Infrastructure Playground In Queens." Accessed June 17, 2023.

<https://www.tpl.org/media-room/trust-public-land-new-york-city-unveil-state-art-green-infrastructure-playground-queens>.

includes the New York City law that requires at least 2.5 acres of parkland per 1,000 residents in each community district.¹⁶

These efforts recognize the importance of greenspaces in promoting health and well-being, as well as the need to address historic inequalities in access to these resources. By prioritizing greenspace development in historically redlined areas, these initiatives aim to promote equity and improve quality of life for residents in these communities. This funding serves to foster the advancement of sustainable practices and address critical environmental issues on the state level.

However, despite the bipartisan support for greenspace development within this bill, there are still notable challenges to be addressed. Namely, the rapid growth of urban populations has led to mounting pressure on green spaces due to processes of urbanization involving expansion and densification.¹⁷ Densification refers to the process of increasing the population density or building density in an area. It typically involves intensifying land use within existing urban or developed areas by constructing taller buildings, increasing building heights, or adding more housing units or structures.¹⁸ The aim of densification is often to accommodate a growing population. While densification has been proposed as a means to curb urban expansion, the provision of green spaces poses a significant challenge.¹⁹ Green spaces are often perceived as easily replaceable when they interfere with new developments and infrastructure projects.²⁰ Urban planners face the complex task of balancing various competing demands, such as housing affordability, economic development, and infrastructure provision.²¹ However, they often lack guidance on how to effectively prioritize and incorporate green spaces into their plans, leading to a lack of strategic direction and implementation targets.²²

The absence or insufficient presence of greenspaces in redlined communities, excessive urban heat, and sparse tree canopy is related to the phenomenon of densification in which structures such as tall buildings, roads, and other infrastructure absorb and re-emit the sun's heat more than natural landscapes such as forests and water bodies.²³ Thus, further research and analysis are crucial for the effective implementation of greenspaces.

¹⁶ "2024 Parks and Open Space Plan - Parks | Seattle.Gov." Accessed June 17, 2023.

<https://www.seattle.gov/parks/about-us/projects/2024-parks-and-open-space-plan>.

¹⁷ Artmann, M., Mueller, C., Goetzlich, L., & Hof, A. (2019, September 4). *Supply and demand concerning urban green spaces for recreation by Elderlies living in care facilities: The role of accessibility in an explorative case study in Austria*. *Frontiers*. <https://www.frontiersin.org/articles/10.3389/fenvs.2019.00136/full>

¹⁸ Bush, Judy. 2020. "The Role of Local Government Greening Policies in the Transition Towards Nature-Based Cities." *Environmental Innovation and Societal Transitions* 35: 35–44. <https://doi.org/10.1016/j.eist.2020.01.015>.

¹⁹ Haaland et al. 2015. "Challenges and Strategies for Urban Green-Space Planning in Cities Undergoing Densification: A Review." *Urban Forestry & Urban Greening* 14 (4): 760–71. <https://doi.org/10.1016/j.ufug.2015.07.009>.

²⁰ Haaland et al. 2015. "Challenges and Strategies for Urban Green-Space Planning in Cities Undergoing Densification: A Review." *Urban Forestry & Urban Greening* 14 (4): 760–71. <https://doi.org/10.1016/j.ufug.2015.07.009>.

²¹ Colding et al 2020. "The Incremental Demise of Urban Green Spaces." *Land (Basel)* 9 (5): 162. <https://doi.org/10.3390/land9050162>.

²² Colding et al. 2020. "The Incremental Demise of Urban Green Spaces." *Land (Basel)* 9 (5): 162. <https://doi.org/10.3390/land9050162>.

²³ Antoszewski, et al . (2022). The Future of Climate-Resilient and Climate-Neutral City in the Temperate Climate Zone. *International journal of environmental research and public health*, 19(7), 4365. <https://doi.org/10.3390/ijerph19074365>