Issue At A Glance:

Urban Greening: Impact on Safety and Health

This issue brief explores urban greening as a potential intervention for vacant urban land, which has detrimental impacts on health and safety. We discuss key examples of urban greening interventions along with their benefits on health and safety as well as proposed mechanisms for these benefits.

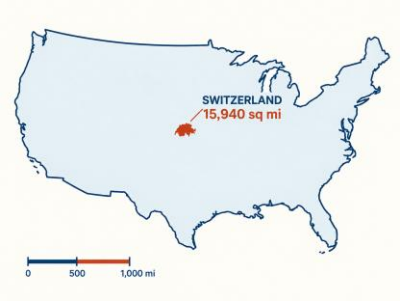
Introduction

In the late 1960's and early 1970's, deindustrialization in the United States contributed to the closure of a large percentage of factories and production plants in urban centers.[1] These closures, in conjunction with racially discriminatory lending practices known as redlining, resulted in the proliferation of overgrown, abandoned lots disproportionately concentrated in neighborhoods predominantly occupied by residents of color.[2] These vacant lots are believed to increase the rate of crime through various mechanisms including the provision of cover for illegal activity via overgrown vegetation, the signaling of community disinvestment, and erosion of community ties through lack of safe public spaces.[3-5] Urban residents, particularly in low-income neighborhoods, identify these spaces as primary threats to their health and safety.[3]

Vacant lots are often concentrated in neighborhoods with the highest risk of firearm violence, which is the leading cause of death for males ages 15-34 in large central metropolitan areas.[4] Vacant and dilapidated lots are also associated with worse mental health outcomes like depression in addition to increased perceptions of fear and violence, which make outdoor health behaviors less feasible.[6] Prior efforts to remediate abandoned land have classically contributed to involuntary resident displacement and the entrenchment of racial disparities.[3]

Vacant Land in US Cities

Roughly 15% of the land in US cities is deemed vacant or abandoned, an area roughly equivalent to the size of Switzerland.[3]



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A Case Study: Urban Greening in Philadelphia

One noteworthy model for addressing the issue of vacant land was developed in Philadelphia by the Pennsylvania Horticultural Society (PHS) in 2012, in an effort to transform abandoned inner-city lots into green spaces and parks for community benefit.[7] Known as the PHS LandCare Program, this initiative has transformed over 12,000 abandoned lots through partnership with small business contractors (87% minority or women-owned) to clear debris, plant grass and trees, and install fencing along treated lots.[8,9] These lots are maintained on a monthly basis by community members hired by PHS through partnerships with over 20 community-based organizations.[9]

The PHS LandCare Program has also partnered with research organizations to study the effect of vacant lot greening on local crime and resident health.[3,4,6,10] Results from these studies show that over a period of 3 years, greening of vacant lots reduced gun assaults in nearby neighborhoods by 9% and burglary by 8%.[3] Analysis of neighborhoods adjacent to these neighborhoods additionally demonstrated no evidence of increased shootings, suggesting a true reduction in violence as opposed to mere displacement.[3] Survey results indicated the percentage of residents who avoided going outside due to safety concerns dropped by 58%, and rates of self-reported outdoor socializing rose by 75%.[3] An associated study of mental health found a significant reduction in participants feeling depressed or worthless, as well as a 69% reduction in feelings of depression among residents living in neighborhoods below the poverty line.[6] Greening may also serve as a way of restoring some of the value inner-city neighborhoods have lost to disinvestment.[11] Financial analysis shows that property values for homes within a 1000 foot radius of greened lots increase on average by 4.3% in the first year following intervention and 13% after six years.[11] This represents a significant return on investment given that the estimated cost of greening is $2,500 per lot with an average maintenance cost of $400/year.[11]

Resident Response to the LandCare Program

PHS LandCare Program has enjoyed a largely positive resident response to vacant lot greening, mixed with concern from some residents surrounding possible gentrification.[3,8] One ethnographic analysis posited an effect of neighborhood context on resident response, finding that residents in a rapidly developing neighborhood expressed racialized tensions concerning redevelopment policies and neighborhood change, whereas residents in a much poorer more blighted neighborhood expressed almost unanimously positive approvals of the greening program.[3] PHS conducted a resident survey which showed largely positive responses; however, sample size was prohibitively small.[8]



Research Supporting Urban Greening

Busy Streets Theory

There are many theories to explain the ability of urban greening to reduce crime and improve human health. Many of these theories focused on crime reduction center around themes of community investment, guardianship, reinforcement, and social connection.[2-4,10]

While the effects of greening interventions are generally explored more than their mechanisms, one in-vivo randomized trial has investigated the Busy Streets Theory to compare the effect of green spaces maintained by the community vs those maintained by professional landscapers on nearby violent crime. Researchers partnered with the Lots of Green community youth engagement program in Youngstown, OH and found that greened lots maintained by the community program reduced the violent crime density in surrounding areas more than those maintained by professional services.[2] Both green interventions were shown to reduce violent crime compared to controls; however, the effect size was consistently greater for community-lead maintenance efforts. Resident involvement in neighborhood greening efforts and community gardens generally has been shown to increase social capital, social support, neighborhood satisfaction, and improved intergenerational relationships.[2]

Qualitative and ethnographic studies of the Philadelphia urban greening interventions describe residents feeling more positive about their block, more connected to neighbors, safer, and less stressed. Residents frequently mentioned enjoying the sights and sounds of their neighborhood following lot greening, including the sound of kids laughing and the peaceful view of green scenery.[3,8]

Forest Bathing

The physiologic impact of being surrounded by nature represents a burgeoning new area of research that may help to explain the health benefits of urban greening. The Japanese art and science of Shinrin Yoku (literal translation, forest bathing), centers around the restorative, healing, and protective effect of the forest on human health. Research in this area spans the ability of tree aromatics to boost natural killer cell levels, improvements seen in stress and healing responses when looking at natural scenery, mood-elevating microbes found in soil, and neuro-cognitive benefits of "soft attention" neural states encouraged by time spent in nature.[12,13]

Eco-Epidemiology

A broader lens for understanding the therapeutic capacity of greening interventions is through the framework of eco-epidemiology, or the study of how changes in the built environment can impact health on a community scale.[10] Many of the primary health interventions utilized by modern medicine, including counseling, medications, procedures and surgeries, are implemented primarily on the individual level and, therefore, rely on the motivations and circumstances of each patient in order to be effective. Interventions aimed at changing the neighborhood context, however, capitalize on the broad impact of the built environment on each individual resident and the community as a whole. Place-based interventions are additionally thought to create longer-lasting impacts by mitigating the factors which create disease. In contrast, benefits from individual-level interventions can be short-lived as the unchanged system continues to replace individuals who leave high-risk status.[10]

Effect on Environmental Health

Mitigation of urban heat islands and environment-related health threats are additional examples of community-level preventive benefits of urban greening.[14] The addition of green canopy cover and grass work together to create shade, retain moisture, and otherwise reduce the absorption and radiation of heat associated with asphalt and concrete.[14] Through changes to the color and texture of the landscape, residents can experience reduced exposure to extreme heat, suffer reduced rates of heat related illness, and require less energy for cooling their homes.[15] Heat mitigation can also serve as a potential method of reducing disparities in utility expenditures for socioeconomically disadvantaged neighborhoods.[14,16]

Urban greenery can also function to sequester carbon, filter air pollutants and improve air quality of the urban built environment, with significant benefits to respiratory health.[17] Urban greening interventions for vacant land have demonstrated potential to reduce violent crime, improve resident perceptions of safety and wellbeing, and support human health in a variety of domains.[1-17] These interventions represent a cost-effective, community-lead, and environmentally impactful opportunity to improve human wellbeing.

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Heat Mitigation

Canopy cover creates shade which reduces the absorption and radiation of heat into and from the ground. Trees and grass additionally utilize solar energy to convert moisture into water vapor in a process known as transpiration.[18]

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