Title: Are green cities healthy and equitable? Unpacking the Relationship between health, green space and gentrification

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Abstract

While access and exposure to green spaces has been shown to be beneficial for the health of urban residents, interventions focused on augmenting such access may also catalyze gentrification processes, also known as green gentrification. Drawing from the fields of public health, urban planning and environmental justice, we argue that public health and epidemiology researchers should rely on a more dynamic model of community that accounts for the potential unintended social consequences of upstream health interventions. In our example of green gentrification, the health benefits of greening can only be fully understood relative to the social and political environments in which inequities persist. We point to two key questions regarding the health benefits of newly added green space: Who benefits in the short and long term from greening interventions in lower-income or minority neighborhoods undergoing processes of revitalization? And, can green cities be both healthy and just? We propose the Green Gentrification and Health Equity model which provides a framework for understanding and testing whether gentrification associated with green space may modify the effect of exposure to green space on health.

Introduction

In recent decades, the field of urban public health has experienced a shift toward an emphasis on upstream interventions, and a broader understanding within the policy-making world of the concept of "health in all policies"- that is that all social and environmental policies have health implications. However, the potential unintended consequences of interventions on social and environmental conditions within cities have remained understudied and discussed. One example of this dilemma is the case of green gentrification, or gentrification processes accompanying improvements in access to urban green space. While new or improved green spaces benefit residents by providing opportunities for physical activity, improving social cohesion, and reducing air pollution, accompanying gentrification may result in contentious local social relations, and may actually exacerbate inequities in health and other outcomes by determining who benefits from these amenities, and who doesn't, transforming these new green amenities into what we call GreenLULUs and a green paradox.[1] Such impacts thus require the use of complex thinking in promoting urban health equity, and in considering such processes in environmental and social epidemiologic research. While unintended consequences have always been important in the ethical evaluation of public health interventions, considering the unintended consequences of structural environmental changes such as greening is particularly important given the shift toward more upstream interventions with greater proclivity to change social conditions. Here, we understand urban greening as the creation or restoration of green amenities (i.e., parks, gardens, ecological corridors that connect natural areas, greenways, playgrounds and other recreational spaces, etc) in local neighborhoods.

Within this framework, two key questions arise regarding the health benefits of this newly added green space: Who benefits in the short and long term from greening interventions in lower-income or minority neighborhoods undergoing processes of revitalization? And, can green cities be both healthy and just? In order to answer these questions, research must account for the

reciprocal relationship between greening as a public health intervention and gentrification process as a socio-economic process and (at times) political project, which have been shown to accompany new urban greening initiatives. Merging the fields of public health, urban planning and environmental justice, we argue that because the health effects of greening can only be fully understood relative to the social and political environments in which inequities persist, epidemiologic research needs a dynamic model of community that accounts for potential unintended social consequences.

Implementing greening Initiatives

It is well documented that neighborhood environments, both social and physical, affect health and well-being. Many epidemiologic studies document the importance of socioeconomic and racial spatial segregation in the study of health inequities and geographies, by creating vastly inequitable exposure to worse neighborhood social and physical environments, concentrated poverty, and fewer economic and educational opportunities.[2] In addition, physical aspects of neighborhoods such as the presence or absence of parks, pedestrian infrastructure, or retail outlets providing healthy foods, may also impact residents' health.[3, 4] Efforts to improve physical and natural environments in cities, for example through the creation of new parks and gardens, are hypothesized to improve health through promoting physical activity, fostering social support, reducing stress, and lowering exposure to air pollution and other environmental toxins.[5] These green interventions, often described as sustainability or resilience measures, are central to the "healthy city" approach and continue a long history of planning and building municipal infrastructure around improved healthy urban environments and improved health outcomes for residents.[6] Meanwhile, environmental justice studies demonstrate that the greatest burden of negative effects from the environment is concentrated among lower-income and racial or ethnic minorities.[7-12]

Structural changes to the physical urban environment, such as greening, move toward the upstream end of the health intervention spectrum, addressing a relatively distal cause of disease, rather than targeting individualistic behavior changes such as promoting physical activity or improving diets. At the same time, such interventions maintain distance from the political nature of policy interventions designed to change social conditions, which would lie even further upstream. This political nature may also be a barrier to implementing effective upstream interventions.[13] Urban planning processes are indeed influenced by a hierarchy of organized interests which control land use decisions, such as where new parks or other open spaces may be placed, where commercial or residential developments may be authorized, and, even, where industry may remain. This hierarchy traditionally places economic growth-oriented interests at the top, leaving other interests such as social equity, environmental sustainability and health promotion in a subordinate position. In addition, poor stakeholder communications and a tendency toward land use planning that fails to address the comprehensive development of a neighborhood or a district, and the varying needs of its residents, also contribute to planning decisions which do not address health in a comprehensive manner.

Meanwhile, some city plans and planners use health as an apolitical outcome by which to justify municipal expenditures on greening initiatives, in many cases bridging social equity and environmental sustainability,[14] and as a potential benchmark by which to deem such initiatives as beneficial. Yet, researchers in political ecology, urban planning, and urban geography have recently brought to light the potential social injustices of gentrification linked to green initiatives in cities.[8, 9, 15] These socio-spatial dynamics complicate the nature of greening as a "win-win" intervention. In addition, public health practitioners are researchers advocating for greening initiatives who often cite the health benefits of greening without regard to such dynamics, and without heeding the implications of this relationship for health equity in cities.

Green Space and Gentrification: Causality or Reciprocal Determinism?

New or intensified urban socio-spatial inequities have been shown to accompany urban greening agendas and interventions, such as greenways, parks, community gardens, ecological corridors, or restored waterfronts.[16] Much remains unknown about the long-term racial and spatial distribution of the benefits of greening interventions. One central distributional issue is the finding that greening initiatives are sometimes associated with gentrification in historically marginalized neighborhoods.[1, 15, 16] Such "green gentrification" results when parks or gardens, for example, become catalysts for neighborhood revitalization that produce changes in demographic, real estate, and consumption patterns such that the area becomes accessible only for people from more privileged social and ethnic backgrounds.[17, 18] By changing the social environments of neighborhoods, this process may increase stress due to increased local cost of living, changes in local culture and demographics, and potentially force displacement of long term residents, particularly among the most vulnerable urban residents. These gentrification processes may reinforce segregation by race or socioeconomic status, despite initial changes appearing to make neighborhoods more diverse by attracting wealthier or whiter residents.[19] Green gentrification may exclude socially and economically vulnerable residents, both through forced displacement, leading to the re-segregation of vulnerable residents to other areas, and due to changes in neighborhood social environments that may alienate these residents making them feel unwelcome.

Although the causal direction of the relationship between green space and gentrification is uncertain, the association between the creation or restoration of green amenities and increases in the share of college graduates or higher-income residents (both being indicators of gentrification) has been demonstrated.[20] The economic "benefits" of green space is also touted in city plans, building on research demonstrating that property values tend to rise after new green spaces are produced – with further tax benefits and income harnessed by municipalities.[21] That said, it might also be true that resources eventually applied to the creation or improvement of green space may instead be a result of gentrification processes bringing greater economic resources into previously distressed neighborhoods. Regardless of the direction of this relationship, minorities or residents of lower socioeconomic position are known to be particularly sensitive to rising costs and changing social conditions[15] and these may present barriers to remaining in their neighborhoods and benefiting from green spaces.

Gentrification and Health

Gentrification, which has no one cause, is a complex and often contentious topic in the social sciences. As with many social issues, its exact definition, and thus its operationalization in research is varied. Generally, gentrification describes an increase in neighborhood-level affluence, marked by higher housing costs, changes in neighborhood amenities such as the types of stores in a neighborhood, ultimately leading to an increased cost of living in an area.[22] While lower income residents in gentrifying neighborhoods may be displaced by these higher living costs, those who remain in gentrifying neighbors are also affected by changes. Limited research in the public health literature have cited the health effects of both displacement, and of living in gentrified or gentrifying neighborhoods. The displacement of vulnerable residents may result in increases in disrupted social ties and the perpetuation of geographically concentrated poverty, accompanied by increased exposure to chronic stress, leading to worse health outcomes among displaced residents.[23, 24] Furthermore, in the case of green gentrification, displaced residents are thereby excluded from the potential benefits of the environmental amenity. Gentrification may also create new stresses such as raising prices, and changes to protective neighborhood social environments (such as a reduction in social ties), and eventually reduce the positive health impacts of living in proximity to green space, particularly for more vulnerable residents who are not displaced.

Few studies to date have evaluated the impact of gentrification on health among those who are not displaced, but emerging evidence indicates a potential interaction between race (as a measure of social stratification) and gentrification, indicating that gentrification may have benefits for more privileged residents while harming vulnerable residents. Such interactions between gentrification and race have been found in studies of preterm birth,[25] and of general self-rated health.[26] In both cases, while gentrification itself had either no effect, or a modest positive impact on the outcome for residents at large, negative impacts of gentrification were found for blacks. Although the CDC hypothesizes an impressive list of social determinants of health with potential negative health outcomes which may result from gentrification processes,[27] few studies have empirically evaluated these claims. Their list includes health effects, which could result from limited access to affordable housing, healthy food choices, transportation choices, quality schools, pedestrian infrastructure, and social networks. They also hypothesize that gentrification may lead to increases in stress levels, injuries, violence and crime, poor mental health, and changes in social and environmental justice.

Proportionate Universalism

In addition to the scale at which community health interventions are designed, debate also remains regarding the proportionate universalism of new initiatives. Should interventions target segments of society that are most vulnerable or those who exhibit the worst health outcomes? Or should they aim to improve the health of the entire population, hoping for trickle-down effects to the most socially vulnerable residents? Is it better to change the shape of the curve, or shift it in its current form toward better health, inequities and all? The unintended consequences of upstream interventions may result in interventions that do neither. Although green spaces can

easily be conceptualized as a universal intervention, aiming to improve the health of all residents of a neighborhood, as described above, displacement, changing social environments and the additional stresses of living in a gentrifying neighborhood may cause the exclusion of vulnerable residents from the benefits of new green spaces. Likely, the benefits of such interventions, when mediated by gentrification processes, may produce a more complex pattern of health and social outcomes which should not be ignored. This pattern may create a reverse proportionate universalism, where the benefits are universally felt, but are concentrated among those that are least vulnerable.

What's next?

The Green Gentrification and Health Equity model we propose here (see Figure 1) provides a framework for understanding and testing whether gentrification associated with green space may modify the effect of green space on health. We aim to contextualize the general understanding of the relationship between green space and health within the current sociopolitical environment and develop new empirical research testing the relationships presented here – including the role of gentrification in mediating the relationship between green space and health outcomes. By doing so, we do not wish to discourage the creation or improvement of green space in cities, which is known to improve the environment and health, but rather to promote complex and nuanced thinking regarding urban physical and social environments, and to understand how such interventions may be supported by policies to ensure equitable and sustainable benefits for all.

Figure Legend: A dotted line indicates influences primarily in the North American context.

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Green Gentrification and Health Equity

Dotted outline indicates primarily North American context

Stakeholders and Context:
- Public policy
- Community groups and orgs
- Private investment
- Public/Private Intervention

GENTRIFICATION

Affordability/Change in Amenities

Residential or Cultural Displacement, Disruption of Community Ties

Resident Characteristics (covariates)
- Socioeconomic Status (Education, Income, Employment)
- Gender
- Age
- Race/Ethnicity/Place of Origin/Nativity
- Language
- Time living in neighborhood

New Greening Initiatives
- Parks
- Gardens
- Pedestrian Infrastructure

Accessibility of Healthy Foods
-Cost
-Availability

Crime

Contact with Green/Open Spaces

Stress

Social support/ social interaction

Behaviors/Lifestyle
- Physical Activity
- Diet

Physical and Mental Health Outcomes

Environmental exposures
- Air pollution
- Noise pollution
- Heat

Targets of Upstream Interventions

Targets of Downstream Interventions