



Barcelona  
Laboratory for Urban  
Environmental Justice  
and Sustainability

# Health implications of greening and green gentrification

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# What's health got to do with it?

In justifying resources for parks:

[redacted] A beautiful city with healthy air, water, trees and parks

Residents strongly value the area's natural assets and want to protect air quality, water quality and trees. Access to nearby parks is important for [redacted] and livability of neighborhoods.

Ideal: The city's natural resources are conserved and protected for current and future generations.

- A core value from ForwardDallas! Comprehensive Plan, 2006

In defining "sustainability":

The City of Raleigh uses the following definition:

"Sustainable communities encourage people to work together to create [redacted] where natural and historic resources are preserved, jobs are available, sprawl is contained, neighborhoods are secure, education is lifelong, transportation and health care are accessible, and all citizens have opportunities to improve the quality of their lives."

*The President's Council on Sustainable Development*

- From City of Raleigh Sustainability Initiatives Plan, 2009

# What is health?

**Health** is “a state of complete physical, mental, and social well-being and not merely the absence of disease or infirmity”

-World Health Organization,  
1948

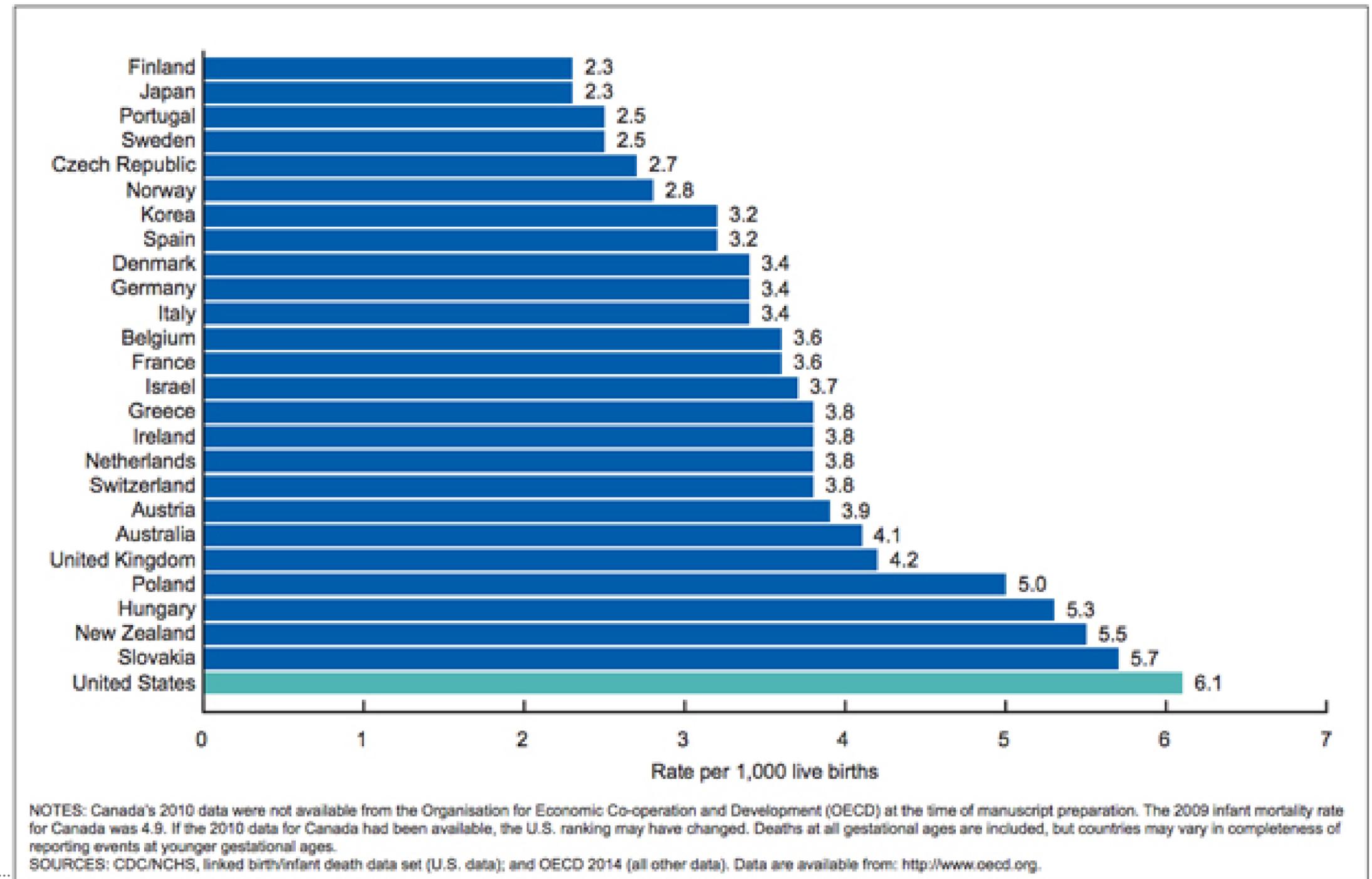
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**Public health** concerns the health of populations, rather than the health of individuals.



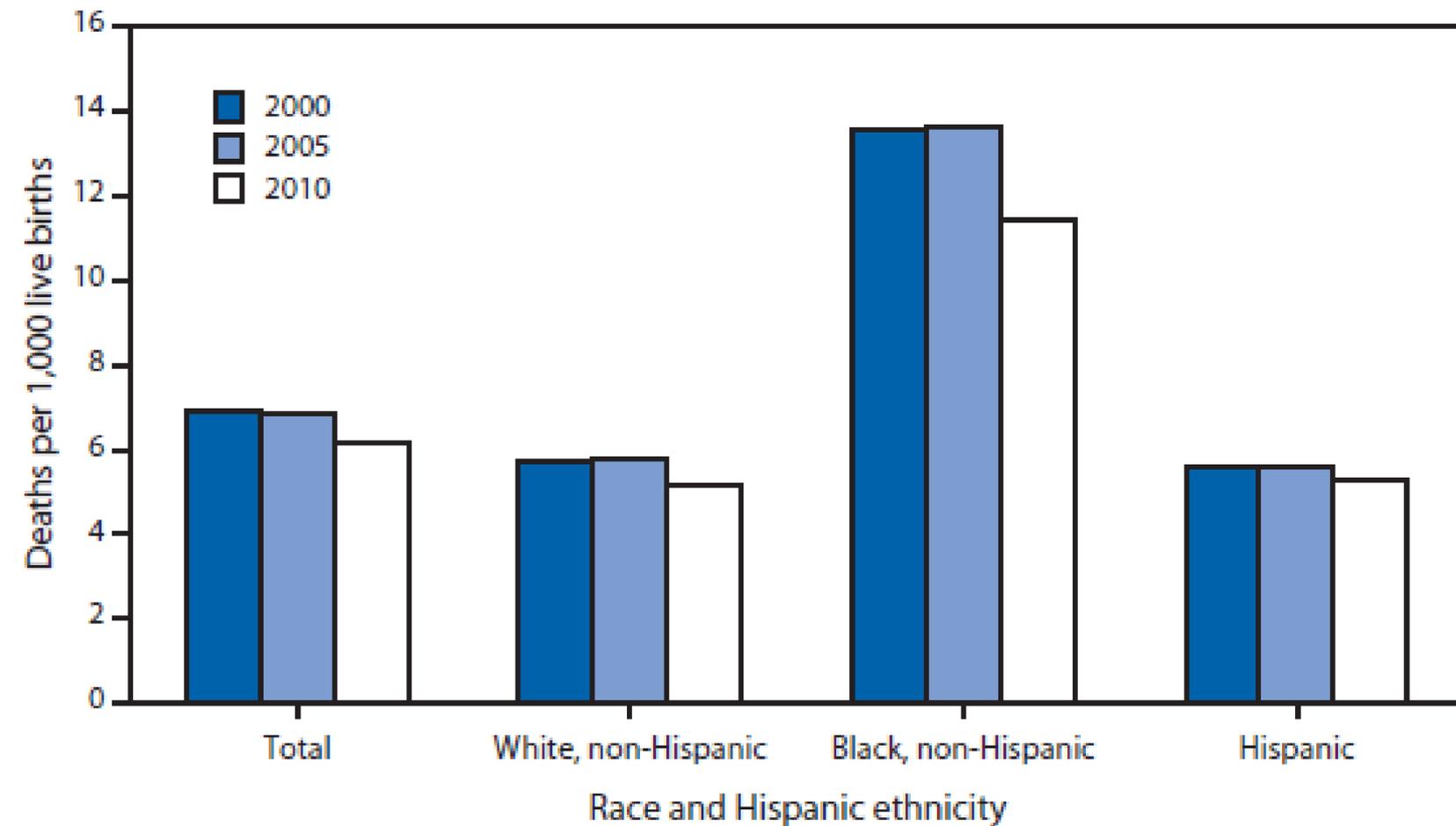
# Health outcomes are not equal

Health inequities occur **between** populations.



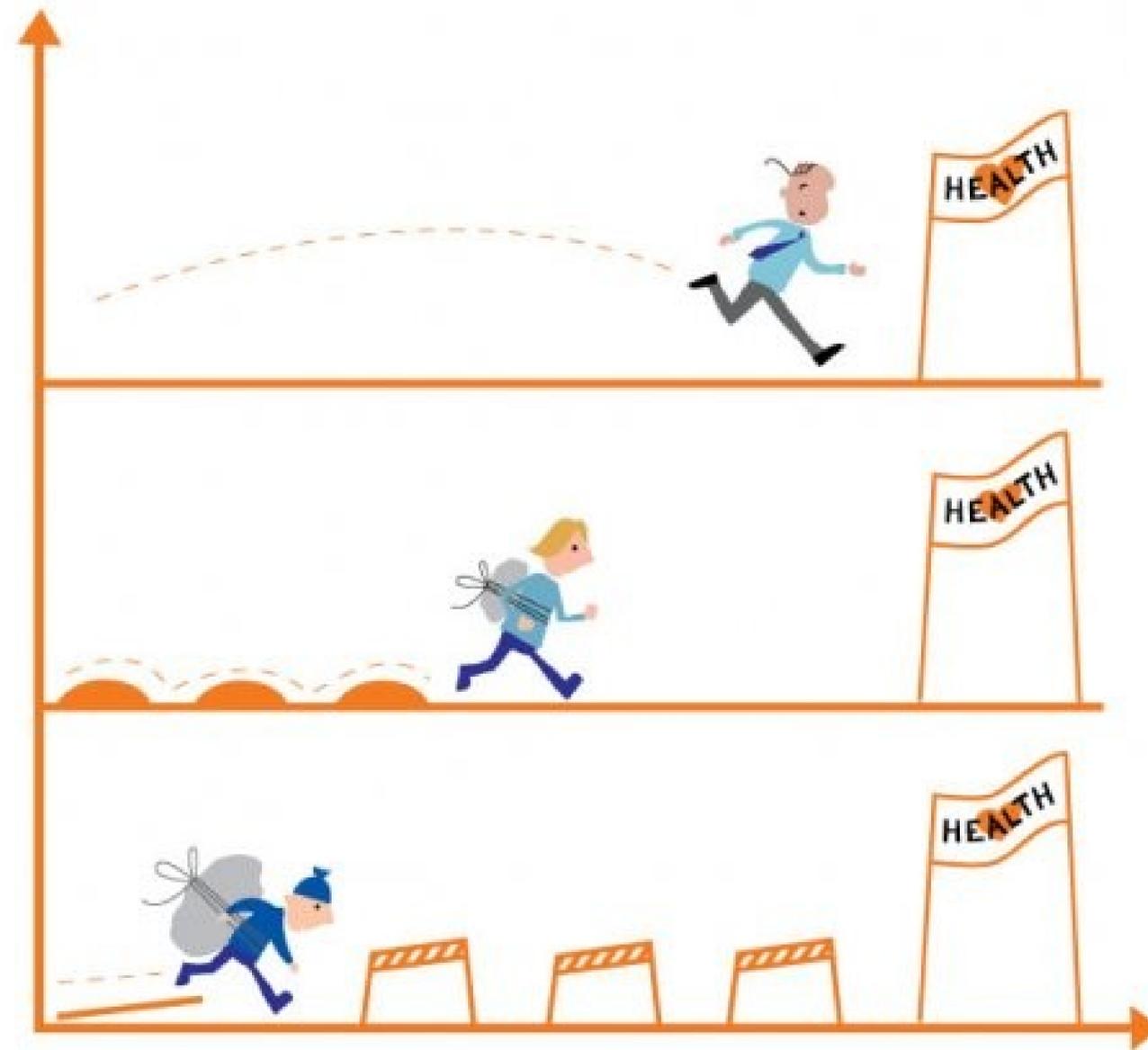
# Health outcomes are not equal

Health inequities occur **within** populations.



# Health outcomes are not equal

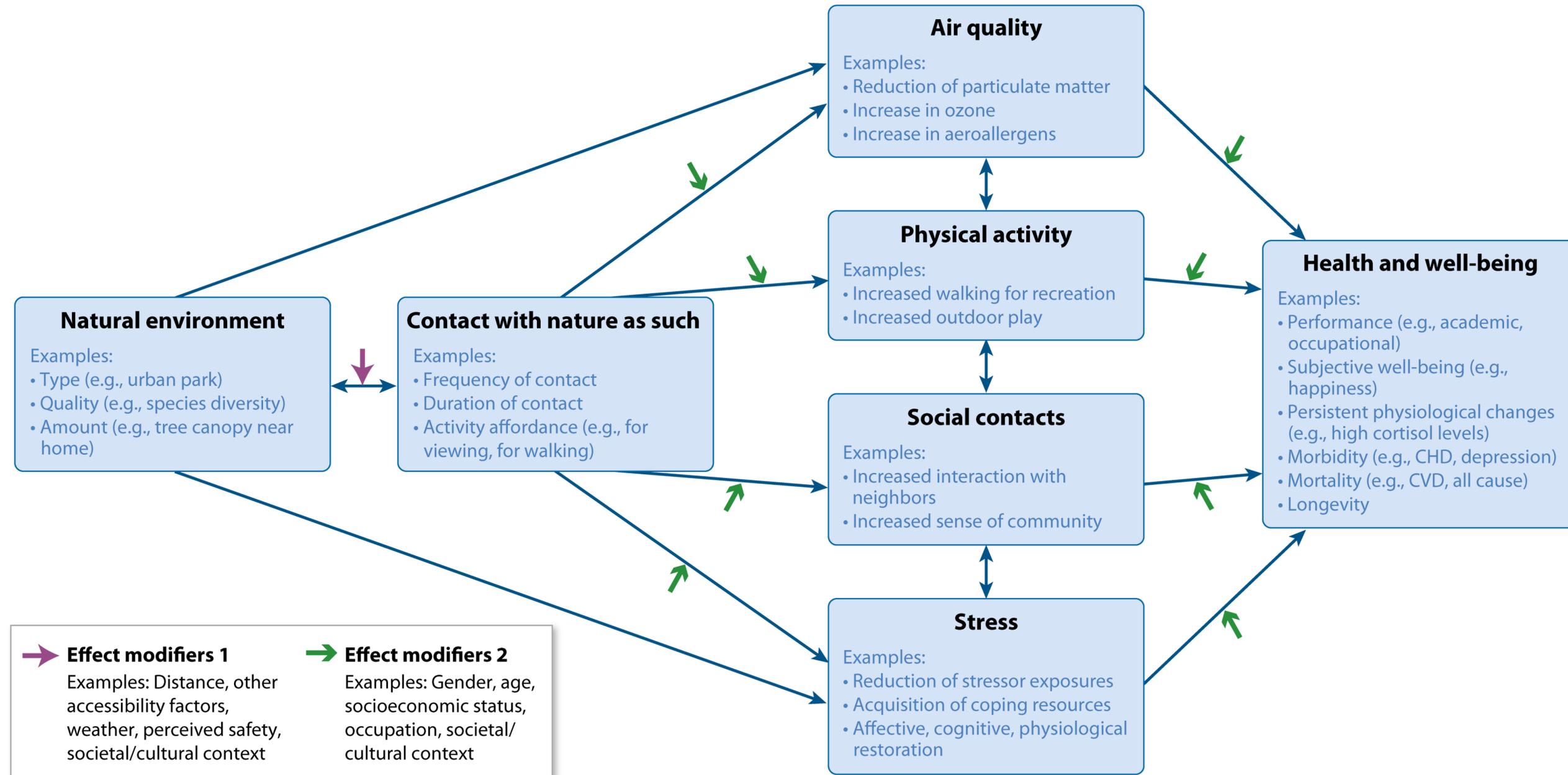
Those with social deprivation/lower socioeconomic status also suffer from worse health.



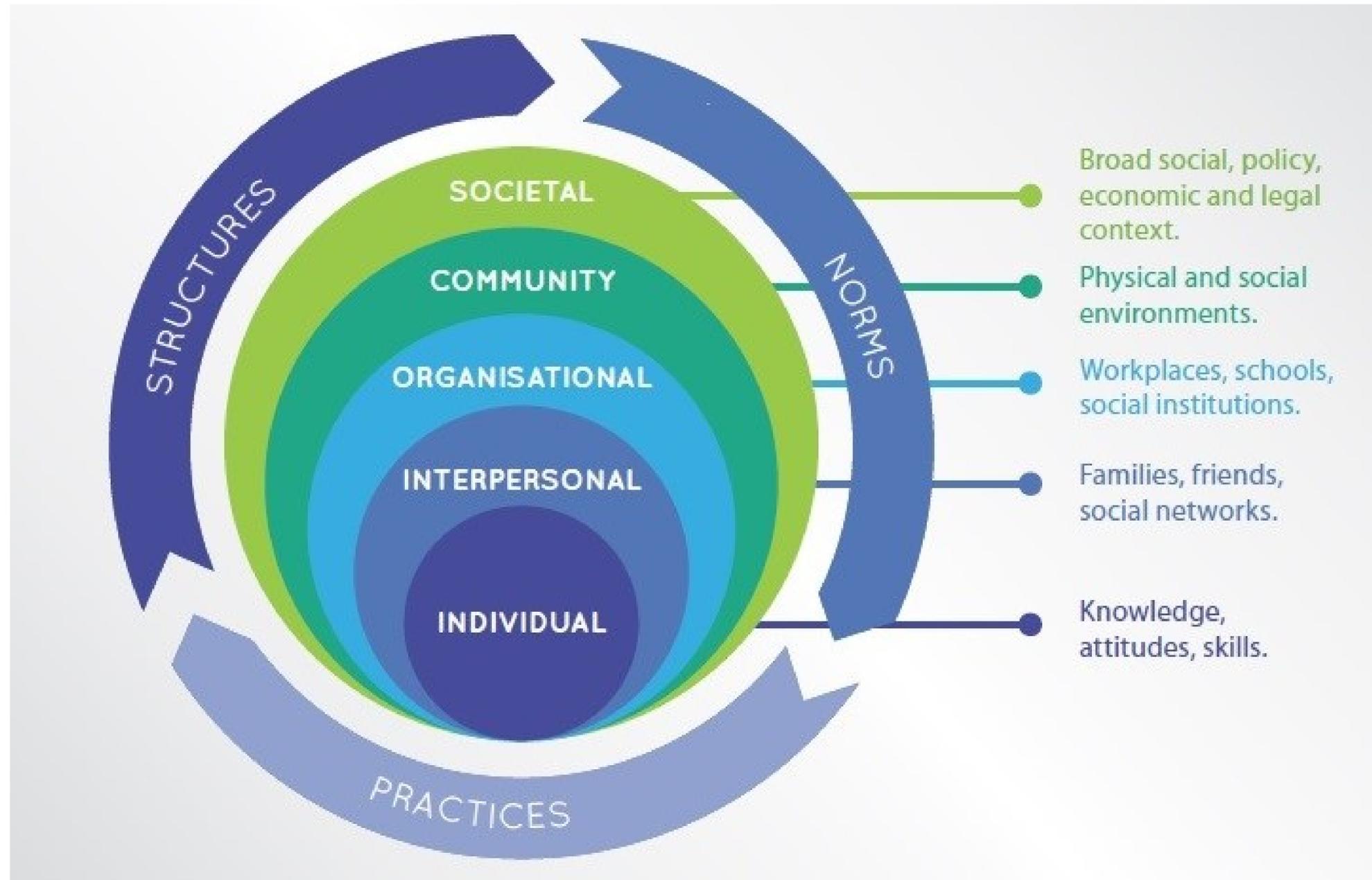
# Green Space and Health

- Having access to green or open space is generally thought of to be **beneficial** for health
- Exposure to natural outdoor environments linked to:
  - Lower mortality (Donovan et al., 2013; Gascon et al., 2016; and others)
  - Improved perceived physical and mental health (Gascon et al., 2015; Triguero-Mas et al., 2015)

# How does green space impact health?



# Socio-ecological model



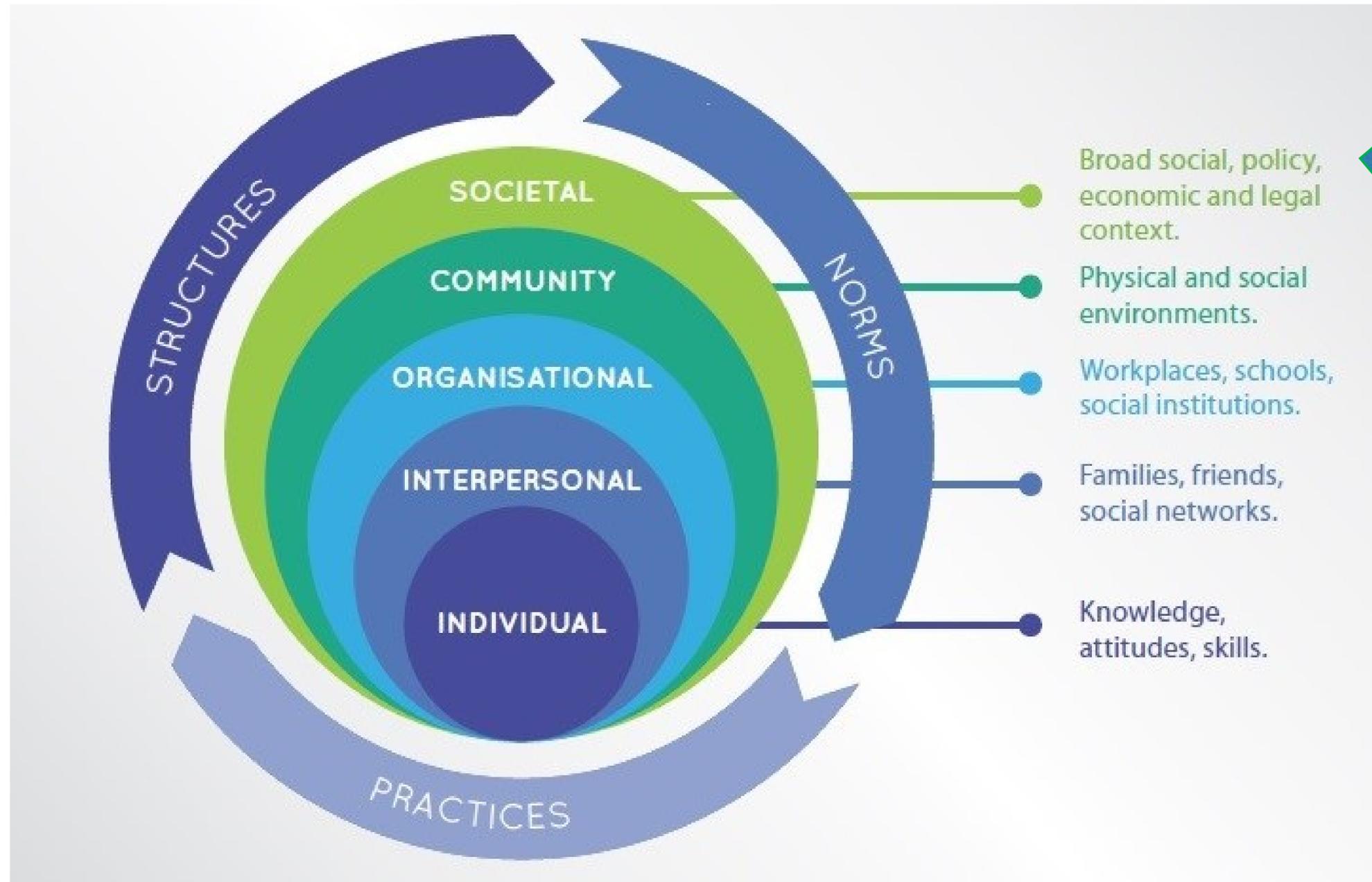
Interventions targeting more **distal** causes of poor health have a greater impact on the health of populations.

However, designing interventions at **proximal** levels is more straightforward.

# Green Space as Public Health Intervention

- Targets a relatively **distal** cause of health (the built environment)
  - May improve health through multiple pathways
    - Physical activity
    - Social interaction
    - Reductions in pollution
    - Reductions in stress
  - Cost may be low per person, since many people may benefit from one intervention
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# Could gentrification be an unintended consequence?



However, an **even more distal cause** of poor health may be the social, policy, and economic context.

# Gentrification and Health

- Aside from the health effects of displacement, little is known about how gentrification may affect health
- Gentrification may adversely affect less advantaged residents
  - While gentrification slightly improved health among residents, it lead to worse self-rated health among Blacks. (Gibbons and Barton, 2016)
- No studies have looked at the health effects of **green gentrification**

# How can we study this problem?

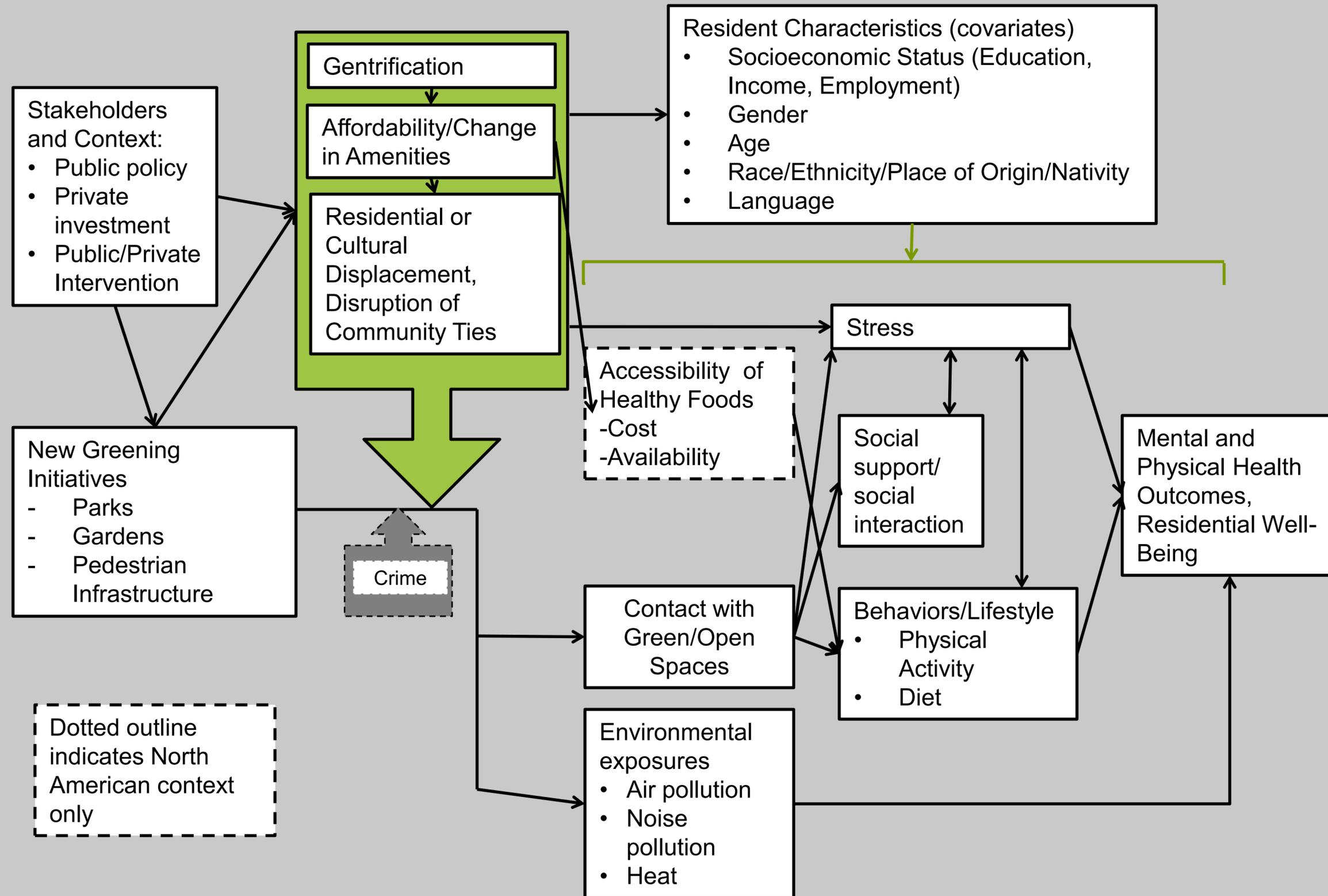
Our research question:

Does **green gentrification** change the relationship between access to green spaces and health outcomes?

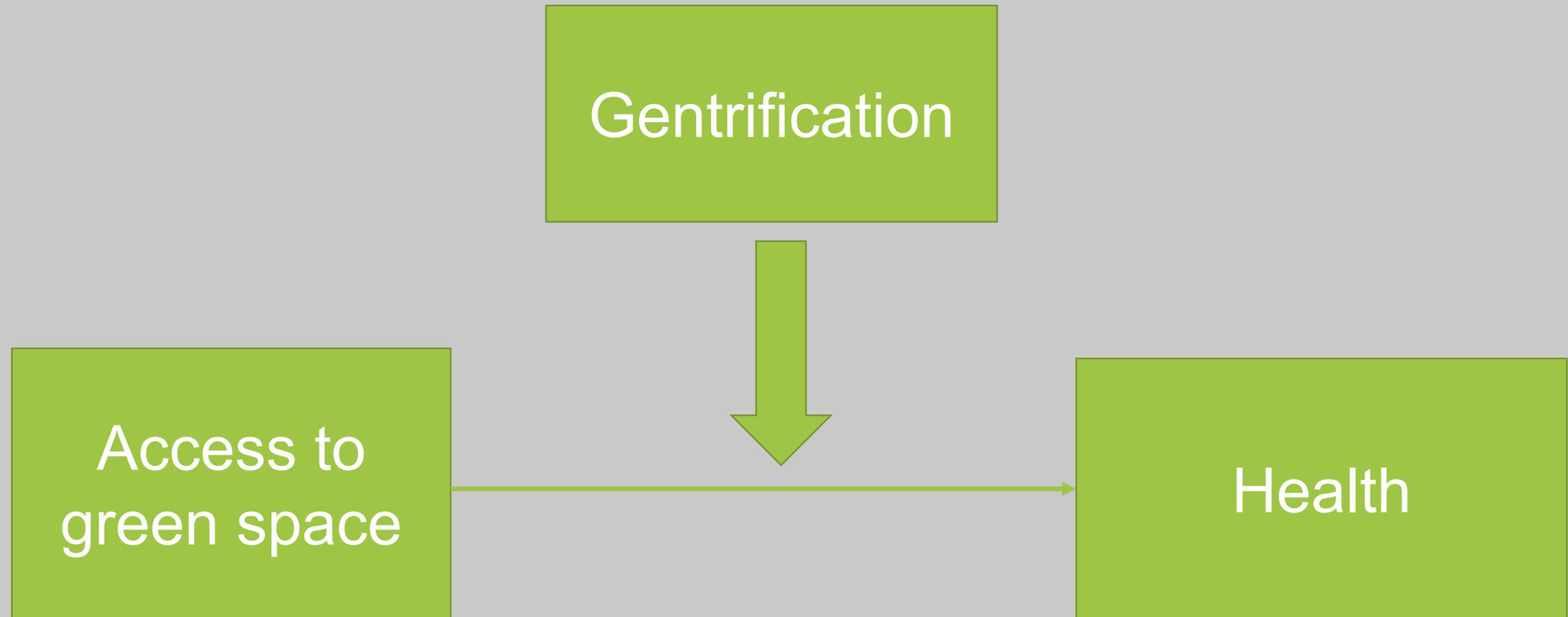
# In other words....

- We know that green space is good for health
  - If green space also leads to gentrification:
    - Does **everyone's health** still benefit from the green space?
    - Could the process of gentrification cause **worse** health outcomes for some and **better** health outcomes for others?
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# Green Gentrification and Health Equity



# Simplified...



# Study Design

- Pilot study of two cities
  - Barcelona
  - New York City
- Cross-sectional case-control design
  - Cases- individuals residing in “neighborhoods” with evidence of green gentrification
  - Controls- individuals residing in “neighborhoods” with new green amenities but no evidence of green gentrification

# Data Sources

- Barcelona

Data	Source	Years	Area Level
Health Outcomes	Barcelona Health Survey, Catalonian Health Survey	2006	x/y
Gentrification Data	Census (See Anguelovski, et al, 2017)	2004-2006 (change)	Census tract
Greening Data	City (See Anguelovski, et al, 2017)	1992-2004	x/y

- New York City

Data	Source	Years	Area Level
Health Outcomes	NYC Community Health Survey	2009-2013	Zip Codes*
Gentrification Data	Furman Center (See Connolly, 2017)	2014/2015 (change from 1990)	Sub-borough areas
Greening Data	NYC Parks, Greenstreets program, NYC Dept of Environmental Protection, LivingLots (See Connolly, 2017)	1990- ?	x/y

# Outcomes

Dimension of Health	Barcelona	NYC
Mental Health	<ul style="list-style-type: none"><li>• Self-reported mental health (GHQ-12)</li><li>• Self-reported depression-anxiety (current or ever)</li></ul>	<ul style="list-style-type: none"><li>• Self-reported “Non-specific Psychological Distress”*</li><li>• Self-reported depression</li></ul>
Physical Health	<ul style="list-style-type: none"><li>• Self-reported asthma</li><li>• Self-reported high blood pressure</li></ul>	<ul style="list-style-type: none"><li>• Self-reported asthma (current/ever)</li><li>• Self-reported high blood pressure</li></ul>
General Health	<ul style="list-style-type: none"><li>• 5-point likert scale</li></ul>	<ul style="list-style-type: none"><li>• 5-point likert scale</li></ul>

\*Non-specific psychological distress is a composite measure of 6 questions regarding symptoms of anxiety, depression, other emotional problems.

# Classification of Cases/Controls

- Only areas with new green amenities identified
- Gentrification dichotomized based on:
  - Scale used in the Barcelona pilot study (0-4) (See Anguelovski, et al, 2017)
  - NYC- rent increases above the median between 1990 and 2014, and other demographic indicators including race, ethnicity, and income show significant change (see Connolly, 2017)

# Analysis

- Regression models, re-run for each outcome
  - Covariates
    - Age
    - Gender
    - SES (Employment, Education, Income)
    - Race/Ethnicity/Nativity
  - Interaction terms to test effect modification:
    - exposure to green \* gentrification
    - exposure to greening \* (social stratification variable)
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# Next Steps for Us

- Continue research to understand how green gentrification affects health
- Identify policy interventions that may prevent green gentrification and protect urban residents from the effects of gentrification while still providing adequate green resources

# Next Steps for You

- Be aware of the complex interactions between changing the build environment and neighborhood/community social environments
  - Be thoughtful about the use of health in planning, and be aware of HOW changes to physical and social environments might impact the health of residents
  - Consider the role of equity- do all residents benefit equally from new interventions?
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# Take Home Messages

- Cities DO need green/open space that is available to residents for recreation
- Having access to green/open space IS beneficial for health
- Green gentrification may be an unintended consequence of greening initiatives in cities, and this process may have health implications

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**THANK YOU!**

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