

Revisiting the role of the urban environment in substance use

The case of prescription opioid overdose fatalities

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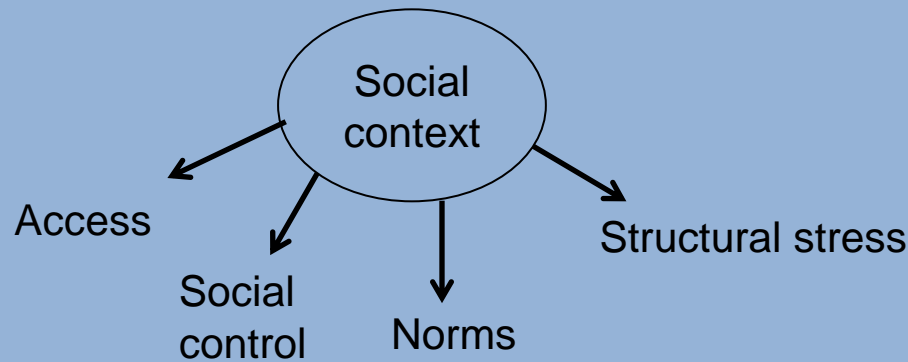
Mortality due to prescription opioids is epidemic

- Drug overdose death rates more than tripled since 1990¹
 - Increase driven by prescription opioids
 - Number of prescription opioid overdose deaths greater than those due to heroin and cocaine combined
- Dramatic increase in urban areas
 - In 1997-2002, number of overdose death involving prescription opioids increased 97%²
 - NYC, 2005-2009: prescription opioids overdose death rate increased 20% while heroin overdose death rate decreased by 24%³

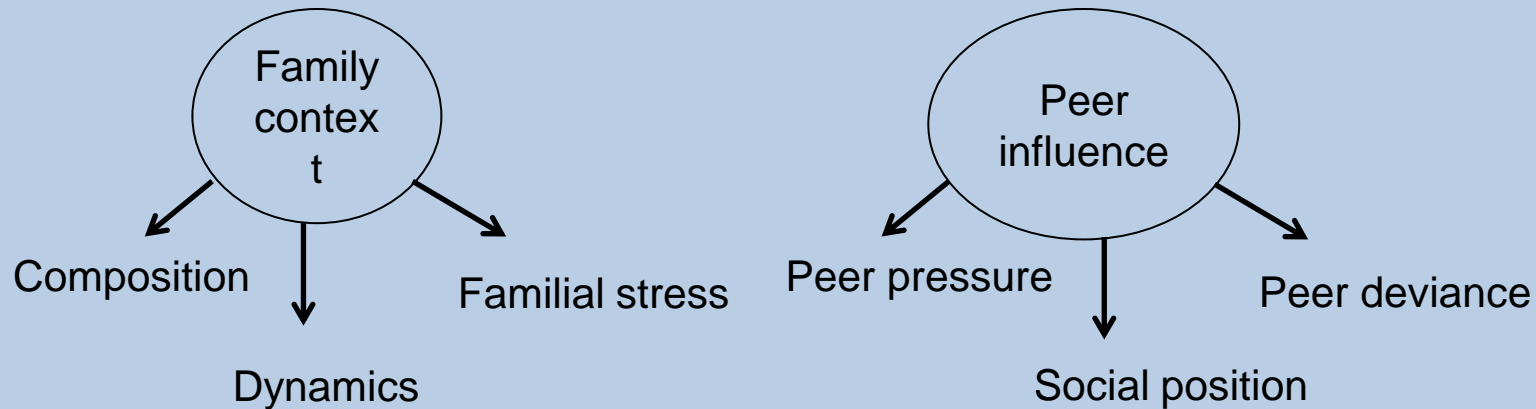
¹CDC, 2011; ²Paulozzi, 2006; ³NYCDOHMH, 2011



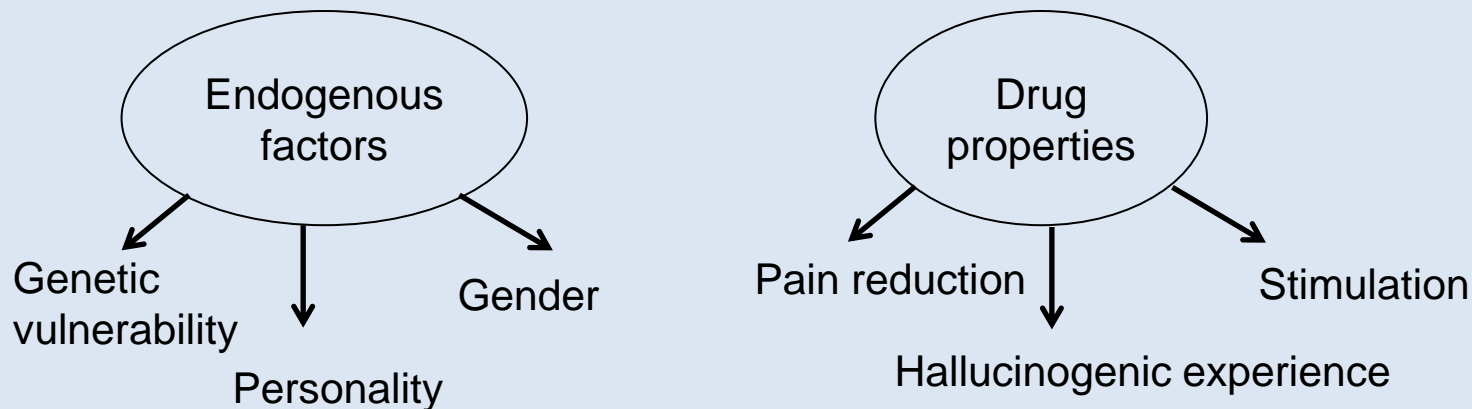
Conceptual framework for drug use (Keyes et al, under review)



Macro level



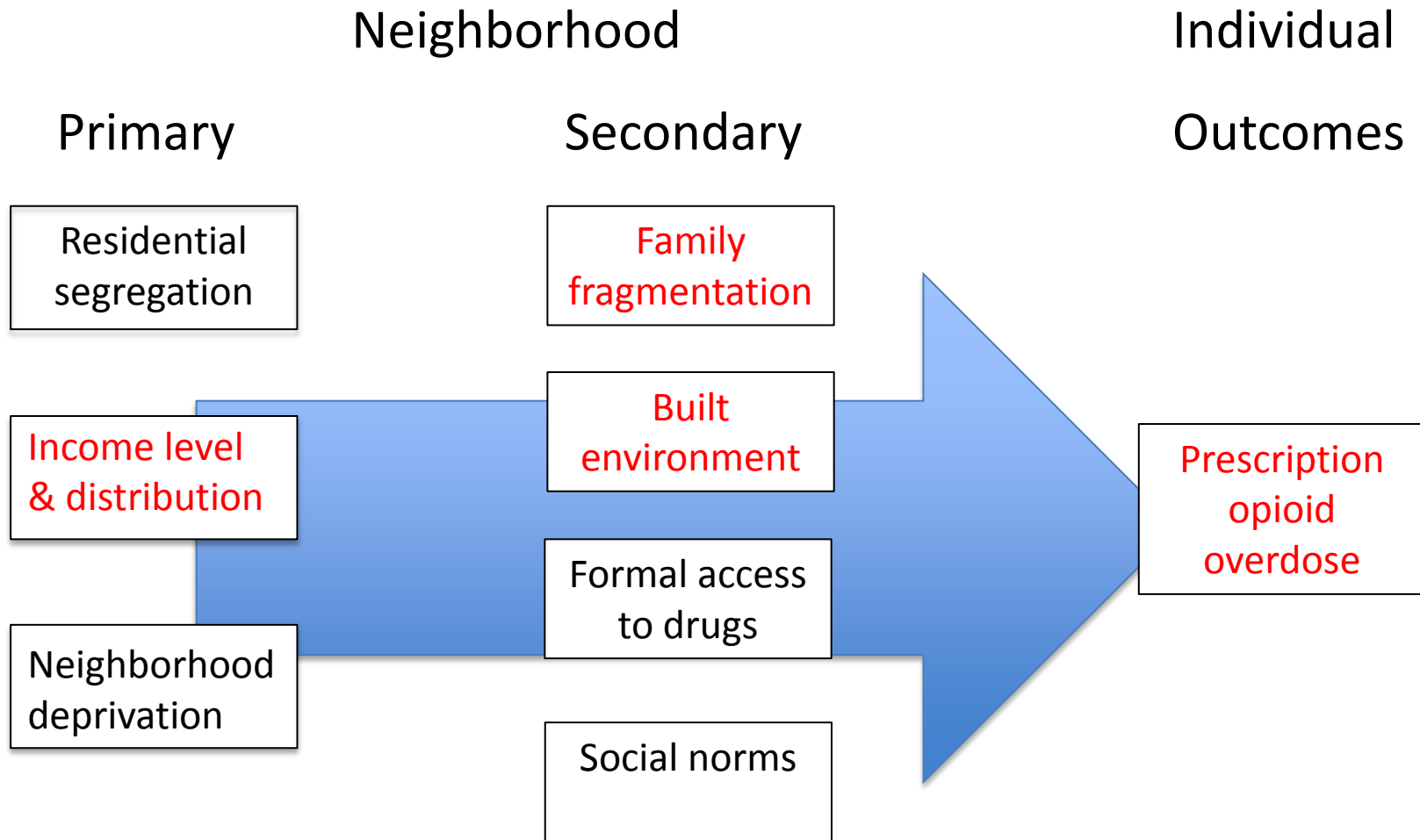
Interpersonal level



Individual level



Conceptual framework of neighborhood influences



Adapted from Galea and Rudenstine, 2005



Study questions: two comparison groups

- What influence do neighborhood primary and secondary features have on:
 - The odds of unintentional death from prescription opioid overdose?
 - The odds of dying from prescription opioid versus heroin overdose?



Methods

- Data:
 - Office of the Chief Medical Examiner of NYC cases of accidental deaths in 2000-2006
 - Cases: 447 deaths from accidental prescription opioid overdose
 - Controls:
 1. Determinants of overall odds: 3436 accidental non-overdose deaths
 2. Determinants of drug-specific odds: 2530 accidental heroin overdose deaths
 - Data linked to neighborhood characteristics in 59 NYC Community Districts in 2000

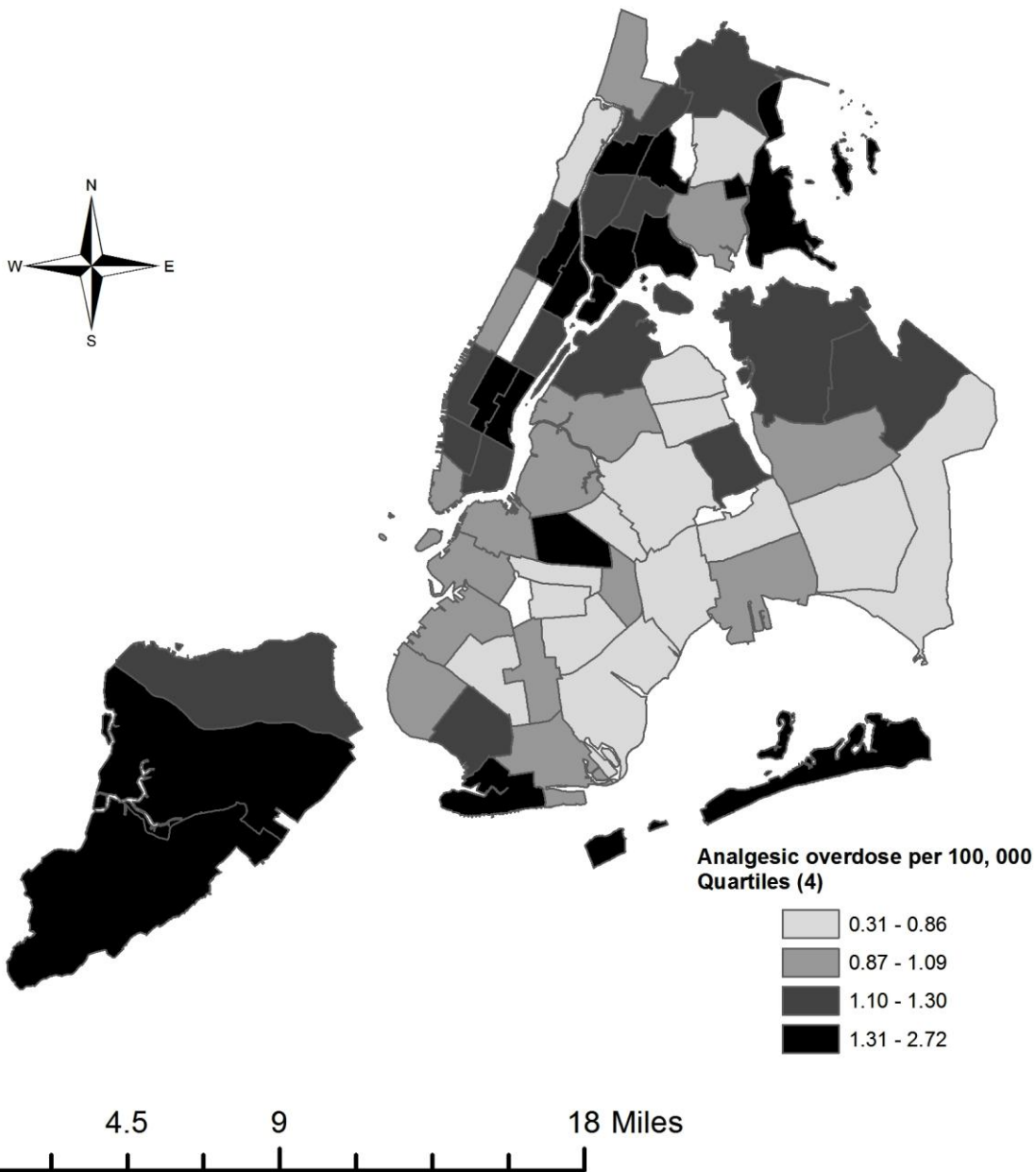


Measures and analysis

- Neighborhood measures, 2000:
 - Primary:
 - Income inequality and Median income
 - Secondary:
 - Disorder: % dilapidated structures; % clean sidewalks
 - Family fragmentation (% divorced/separated; % of children <18 in single-parent HHs)
- Covariates: % Black; % neighborhood drug use; drug arrest rate; age, sex, race/ethnicity
- Analysis: Logistic multi-level models



Analgesic-induced overdose deaths, by Community District (59) New York City, 2000-2006



What shapes the odds of unintentional death from prescription opioid overdose?

Neighborhood

Primary

Outcomes

Median income
OR: 0.82 (0.70, 0.96)

Income inequality
OR: 0.99 (0.86, 1.15)



X

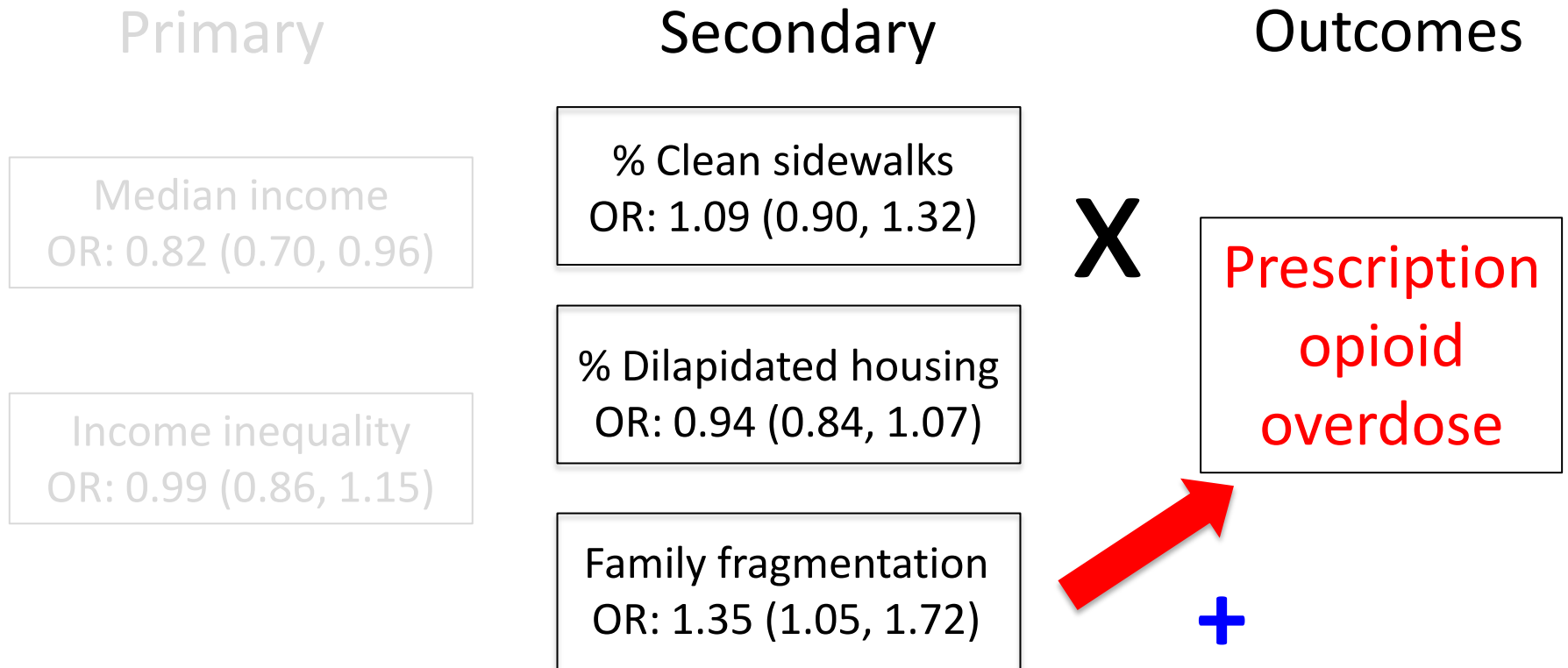
Prescription
opioid
overdose

Multivariable models adjusted for decedent age, sex, and race/ethnicity, neighborhood % Black, % neighborhood opiate use



What shapes the odds of unintentional death from prescription opioid overdose?

Neighborhood



Multivariable models adjusted for decedent age, sex, and race/ethnicity, neighborhood % Black, % neighborhood opiate use



Is prescription opioid overdose driven by different factors than heroin overdose?

Neighborhood

Primary

Outcomes

+

Median income
OR: 1.31 (1.12, 1.54)



Prescription
opioid
overdose

Income inequality
OR: 0.83 (0.68, 1.01)

X

Multivariable models adjusted for decedent age, sex, and race/ethnicity, neighborhood % Black, % neighborhood opiate use



Is prescription opioid overdose driven by different factors than heroin overdose?

Neighborhood

Primary

Median income
OR: 1.31 (1.12, 1.54)

Income inequality
OR: 0.83 (0.68, 1.01)

Secondary

% Clean sidewalks
OR: 1.18 (0.94, 1.49)

% Dilapidated housing
OR: 0.99 (0.81, 1.23)

Family fragmentation
OR: 0.71 (0.55, 0.92)

Outcomes

**Prescription
opioid
overdose**

X



-

Multivariable models adjusted for decedent age, sex, and race/ethnicity, neighborhood % Black, % neighborhood opiate use



Two comparison groups, different results

- Prescription opioid overdose a more likely cause of accidental death in neighborhoods with:
 - Higher economic disadvantage
 - Family fragmentation partially explains economic effect
- Drivers of prescription opioid overdose death distinct from drivers of heroin overdose:
 - Concentrated in higher-income neighborhoods with lower family fragmentation



Specific neighborhood drivers of prescription opioid overdose?

- Availability of prescription opioids:
 - Access to physicians and pharmacies in higher-income, White neighborhoods
- Informal diffusion of prescription opioids:
 - Family and kinship networks in less fragmented, more cohesive neighborhoods
- Social norms supportive of non-medical prescription opioid use
- Higher price of prescription opioids relative to heroin



Conclusions

- Family fragmentation key mechanism facilitating concentration of prescription opioid fatalities in lower-income neighborhoods
- Distinct geographic patterns of prescription vs. heroin overdose fatalities suggest distinct neighborhood drivers
- Given increasing rates of prescription opioid overdose, critical need to identify specific contextual drivers of this new type of drug



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