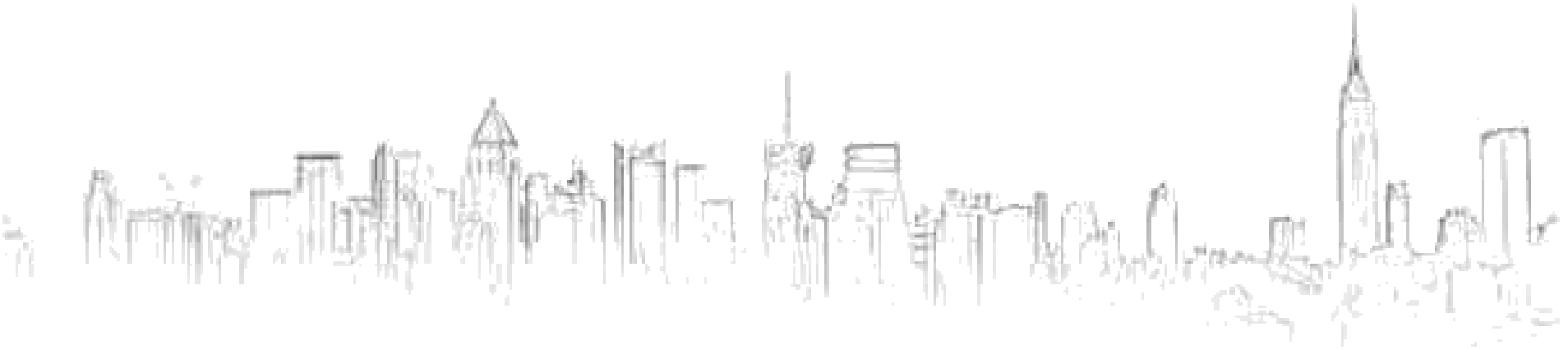
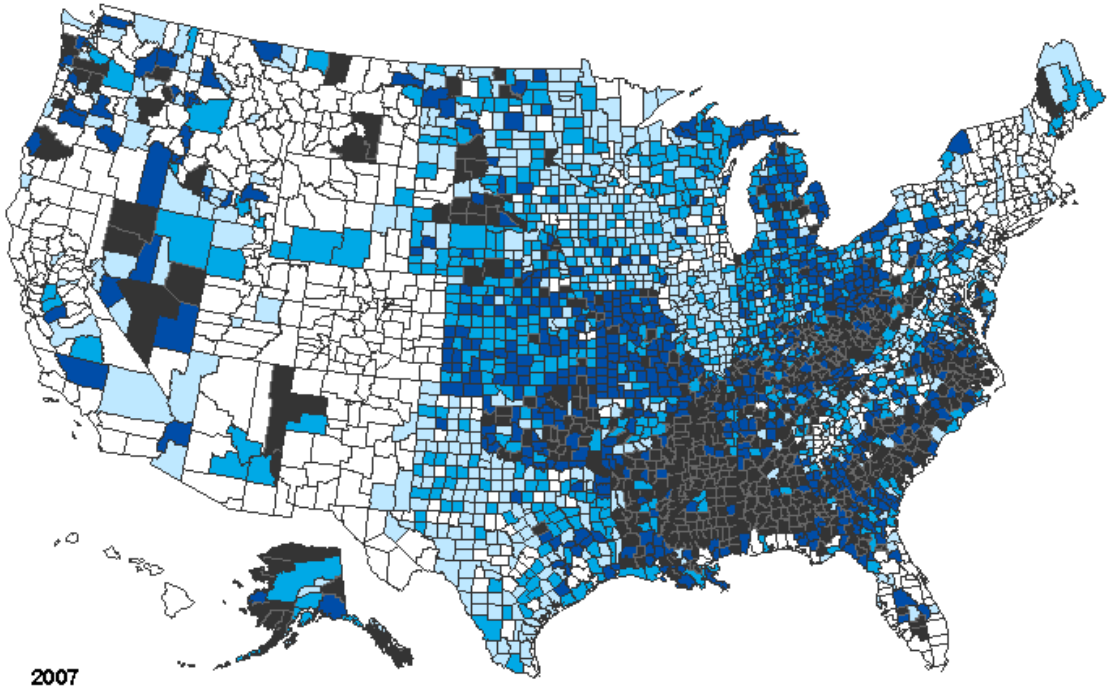


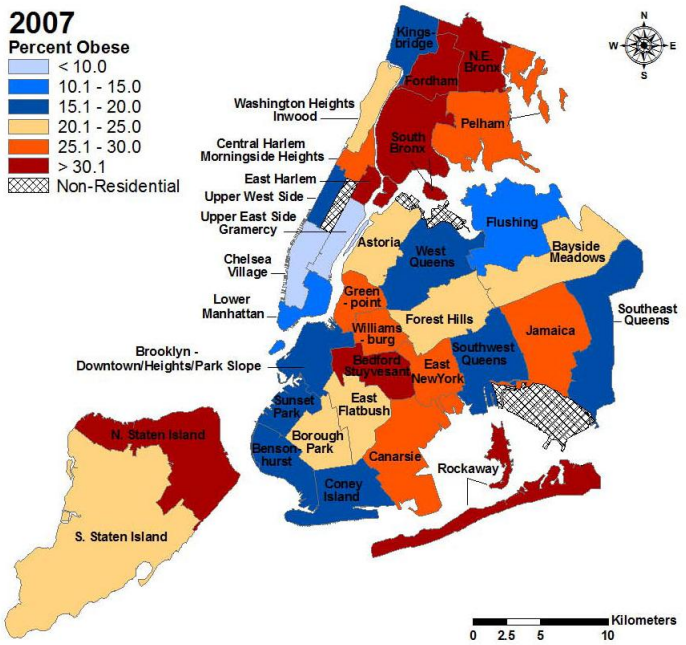
Safety Hazards and Aesthetic Amenities Associated with Active Transportation and Obesity in New York City

Gina S. Lovasi, PhD, MPH
Columbia University

Obesity prevalence varies spatially

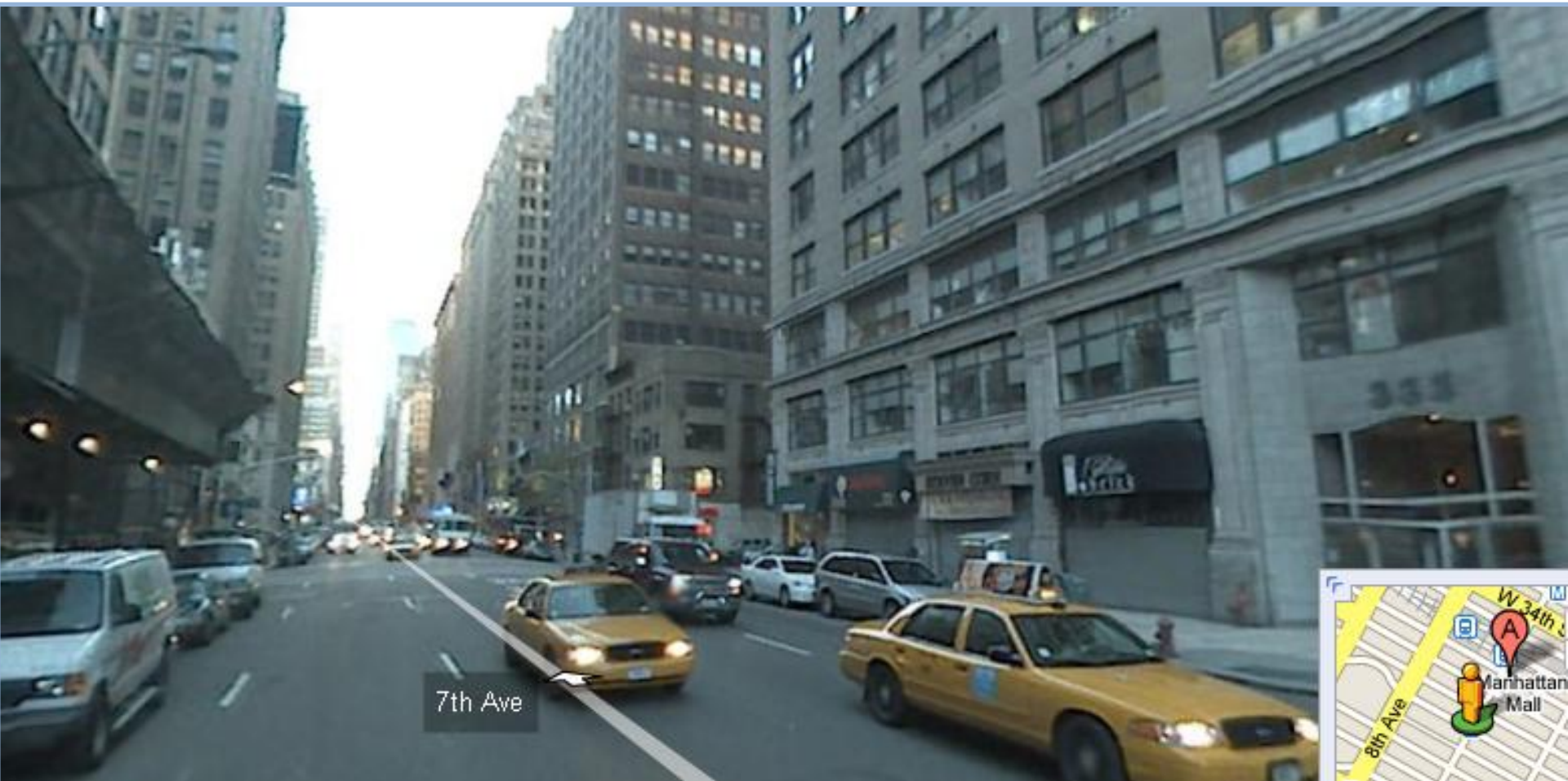


MMWR 58:1259-1263, 2009



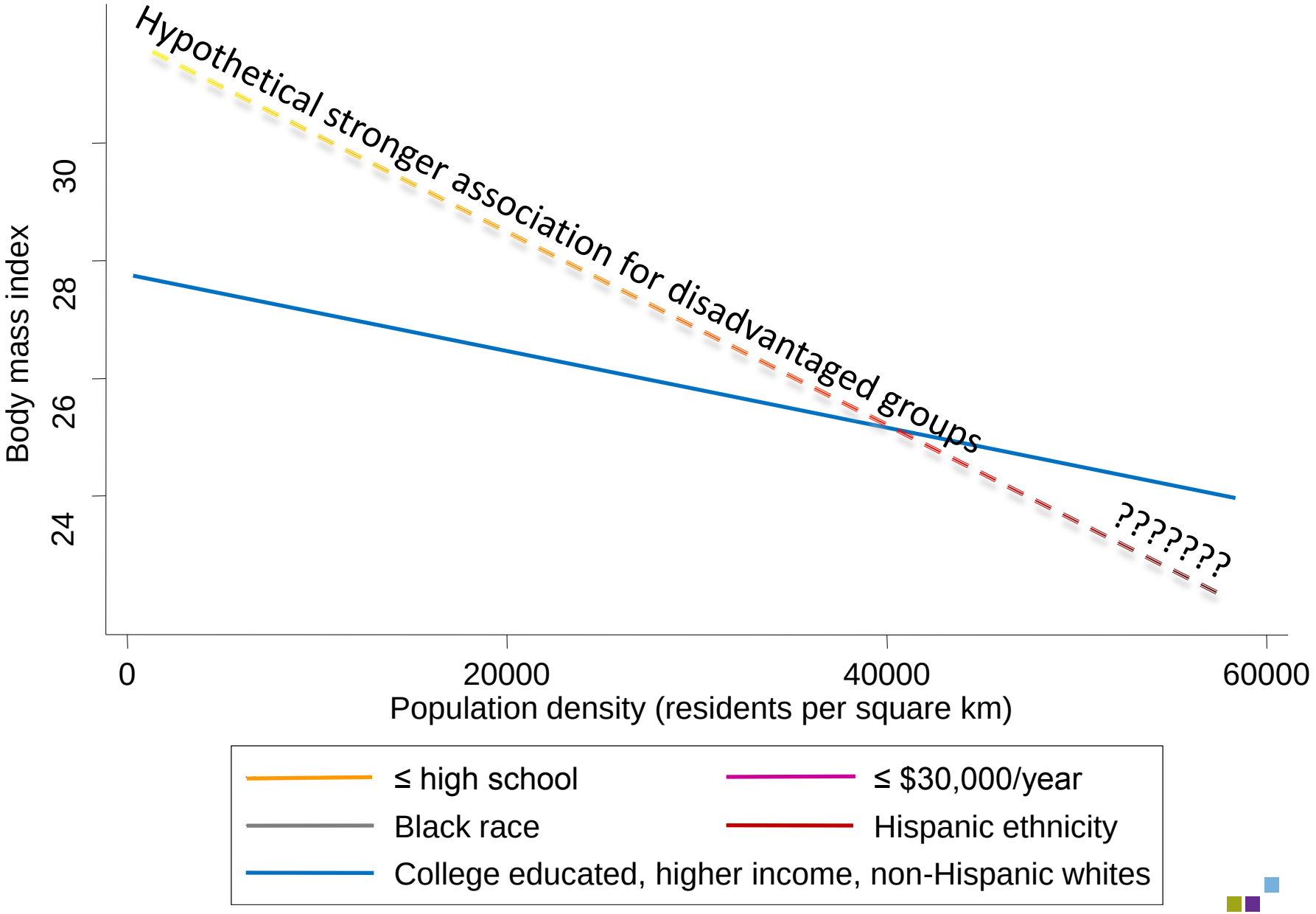
Black JL, Macinko J. AJE 2010;171:765–775

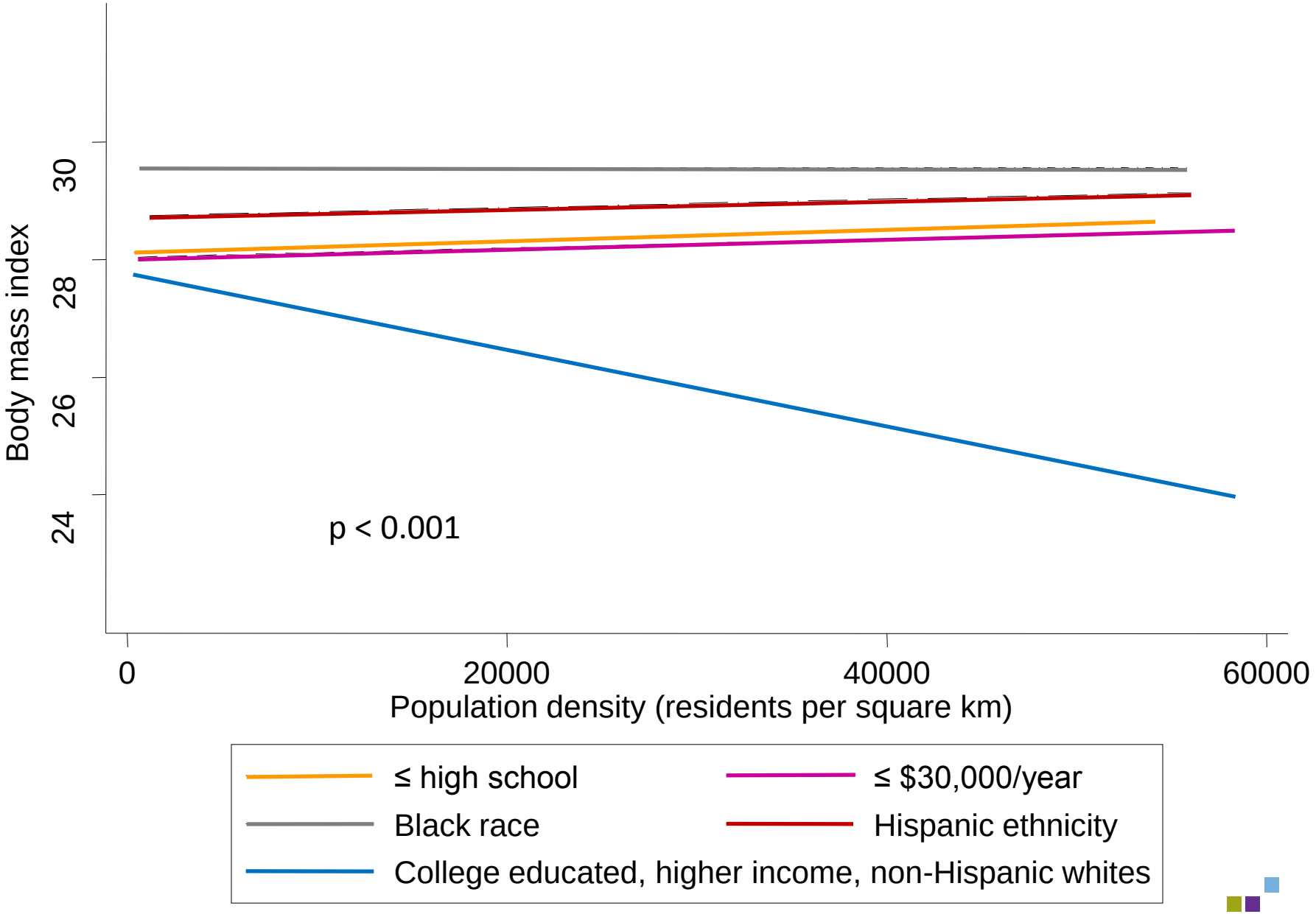
Midtown Manhattan
as seen on Google Street View



Lower East Side, Manhattan

Residential Staten Island


Hypothetical stronger association for disadvantaged groups
??????
Body mass index
24
26
28
30
0
20000
40000
60000
Population density (residents per square km)
≤ high school
≤ $30,000/year
Black race
Hispanic ethnicity
College educated, higher income, non-Hispanic whites



Lovasi GS, et al. *American Journal of Public Health*. Feb 2009;99(2):279-284.

Multiple Measures of the Built Environment

Defining Aesthetics and Safety

Aesthetic characteristics:	**Definition**
Sidewalk café	Any vs none licensed
Street tree density*	Street trees from census per km^2
Clean streets*	Percent of streets rated acceptably clean
Safety hazard indicators:	
Homicides*	Rate per resident based on point locations
Pedestrian-auto fatalities*	Rate per resident based on nearest intersection

* Continuous variables re-scaled to have an interquartile range of 1

Community Health Survey

- Active transportation and sociodemographic characteristics assessed via CATI among 8,034 adults

  "Over the past 30 days, have you **walked or bicycled more than 10 blocks** as part of getting to and from work, or school, or to do errands?"

  (excluded if responded "unable to do activity")

- Sample can be weighted to represent NYC adult population, but confidentiality restrictions limited neighborhood definition to ZIP code

Associations with Active Transportation (Walk/Bike≥10 blocks)

Aesthetic characteristics:	RR
Sidewalk café	**1.10**
Street tree density	1.02
Clean streets	1.03
Safety hazard indicators:	
Pedestrian-auto fatalities	0.97
Homicides	1.02

* Single model with all aesthetic and safety characteristics entered simultaneously, adjusting for demographics, neighborhood composition, and walkability

Stronger Associations in Low Poverty Areas

Aesthetic characteristics:	RR	RR, high poverty	RR, low poverty
Sidewalk café	**1.10**	1.02	**1.14**
Street tree density	1.02	0.96	**1.08**
Clean streets	1.03	1.02	0.98
Safety hazard indicators:			
Pedestrian-auto fatalities	0.97	0.99	**0.95**
Homicides	1.02	0.96	1.06

* Single model with all aesthetic and safety characteristics entered simultaneously, adjusting for demographics, neighborhood composition, and walkability

Associations with Frequency of Active Transportation

Aesthetic characteristics:	Exp(β)
Sidewalk café	0.97
Street tree density	1.06
Clean streets	0.97
Safety hazard indicators:	
Pedestrian-auto fatalities	**1.10**
Homicides	**0.79**

Can be interpreted as a 10% increase in frequency of active transportation for an increase in ped-auto fatality rate equal to IQR (opposite of hypothesized direction)

Can be interpreted as a 21% decrease in frequency of active transportation for an increase in homicide rate equal to IQR

* **Zero-inflated negative binomial** model with all aesthetic and safety characteristics entered simultaneously, adjusting for demographics, neighborhood composition, and walkability (RR for excess zeros not shown)

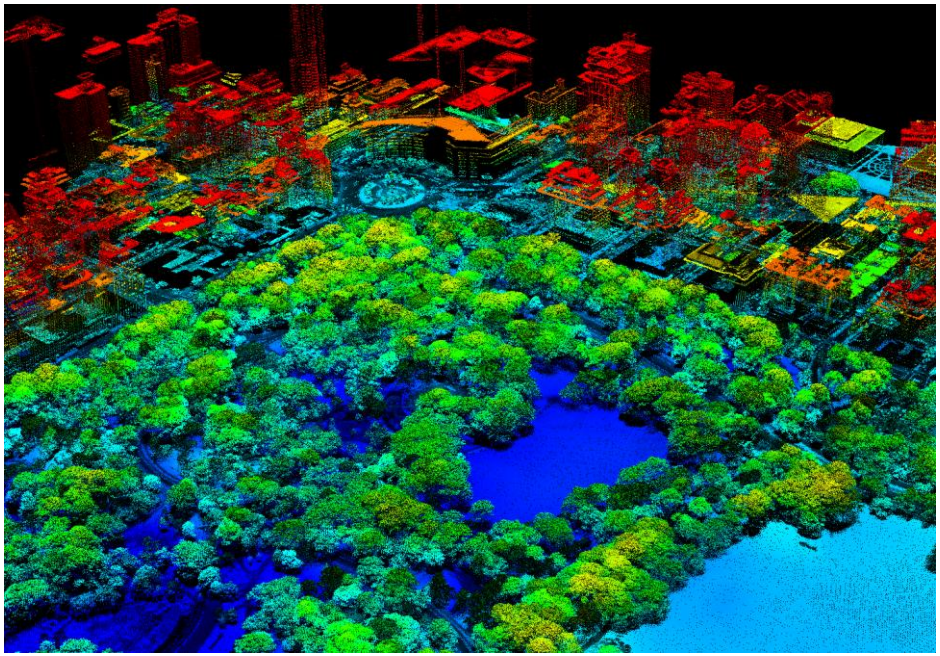
Conclusions

- Aesthetic amenities such as sidewalk cafés and street trees predicted engagement in active transportation, with some indications this pattern was mainly relevant to more affluent areas vs high poverty areas

- While homicide rate was associated with less frequent active transportation as hypothesized, we found an unexpected and significant association between pedestrian auto-fatalities and more frequent active transportation which may reflect an imperfect denominator

What's Next?

- Better geographic measures and broader set of outcomes
- Longitudinal and causally informative studies



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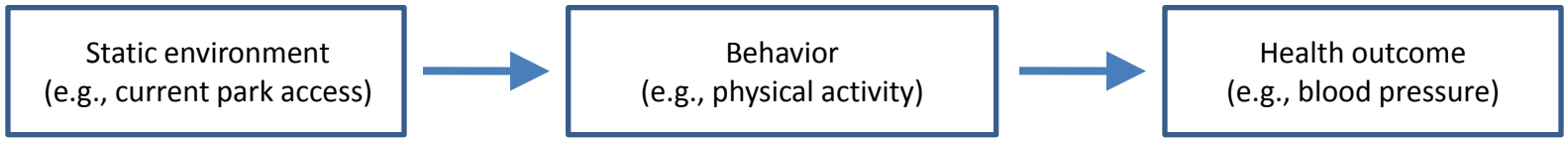
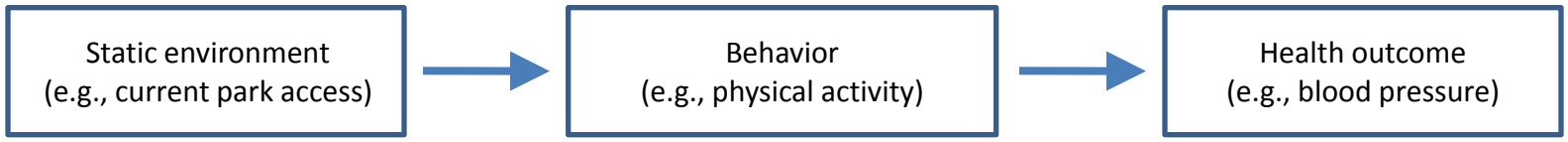


Simplifying assumption that causal relationships are automatic and uniform has facilitated interpretation of cross-sectional studies

Blacksher, E., Lovasi, G.S., 2011. Health & Place.

a.



Simplifying assumption that causal relationships are automatic and uniform has facilitated interpretation of cross-sectional studies

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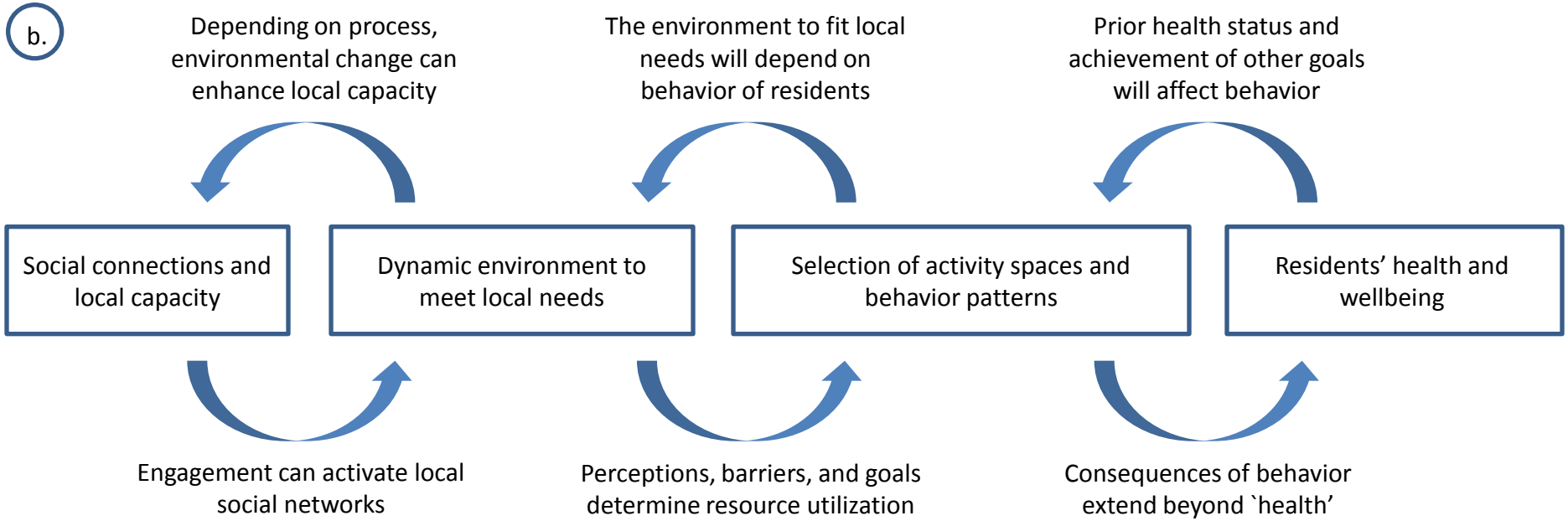
b.



Complexity and social context are recognized, requiring awareness of the role of human agency

Blacksher, E., Lovasi, G.S., 2011. Health & Place.

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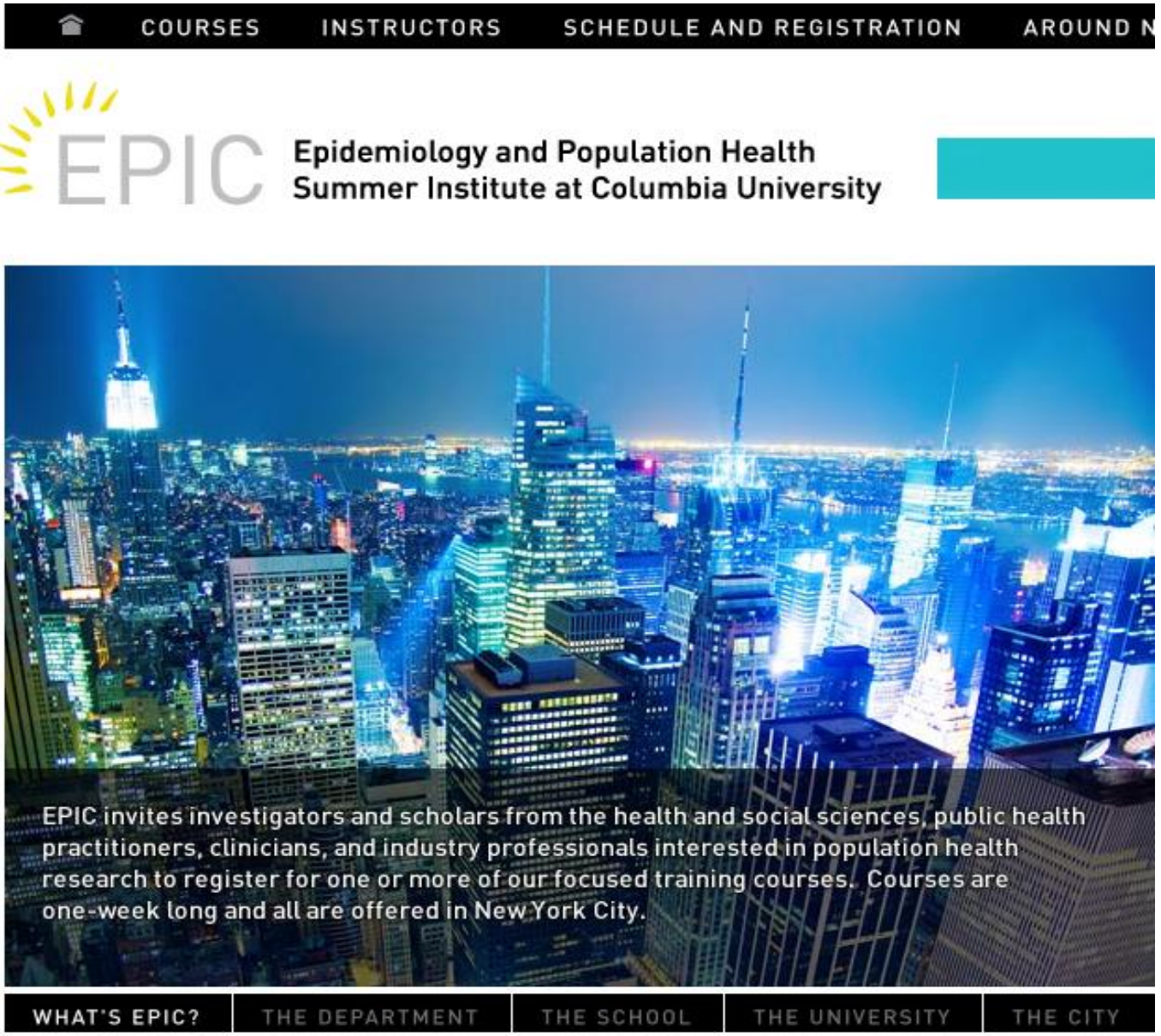

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WEEK 1: JUNE 4-8

- AM Advanced Epidemiology: Applications in Causal Thinking
- AM Epidemiology of Complementary and Alternative Medicine
- AM Introduction to Biostatistics
- PM Epidemiological Analysis Using SAS
- PM Lifecourse Epidemiology
- PM Epidemiology of Diabetes and Obesity
- PM Program Evaluation in Public Health
- PM Introduction to Observational Epidemiology

WEEK 2: JUNE 11-15

- AM Select Topics in Social Epidemiology
- AM Nutritional Epidemiology
- AM Public Health Surveillance
- PM Infectious Disease Epidemiology
- PM Longitudinal Data Analysis
- PM Geographic Information Systems
- PM Assessing and Managing Risks

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WEEK 3: JUNE 18-22

- AM The Ethics of Public Health
- AM Cancer Epidemiology
- AM Systematic Review and Meta-analysis
- AM Introduction to Multi-Level Modeling
- AM Introduction to Pharmacoepidemiology
- PM Approaches to Race in Epidemiological Research
- PM Analysis of Complex Survey Data
- PM Clinical Epidemiology
- PM Measuring Patient Reported Health Outcomes

WEEK 4: JUNE 25-29

- AM Structural Interventions
- AM Genetic Epidemiology
- AM Comparative Effectiveness Research Methods
- PM Randomized Clinical Trials
- PM Social Media in Population Health Communication
- PM Logical Reasoning in Human Genetics
- PM Place and Health
- PM Epidemiologic Analysis Using Stata

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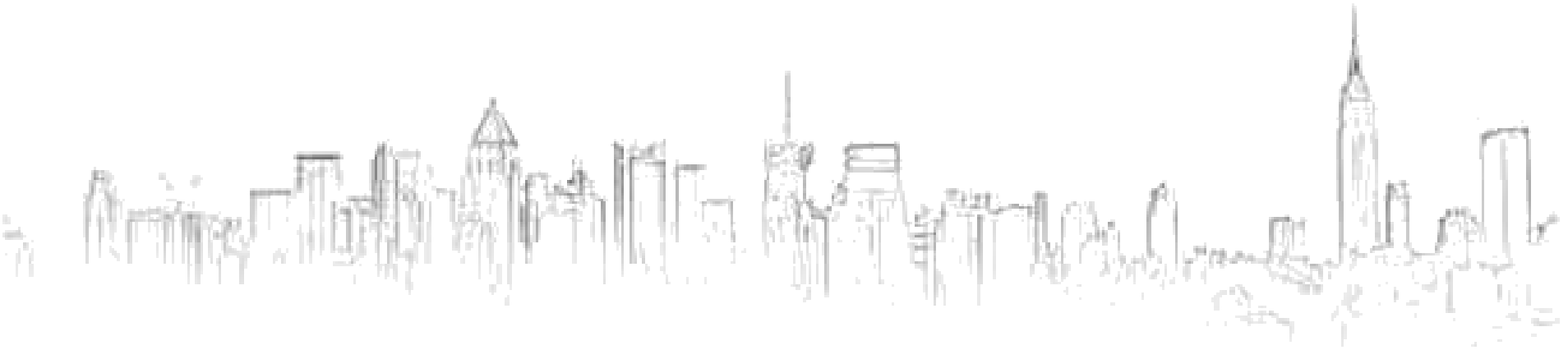
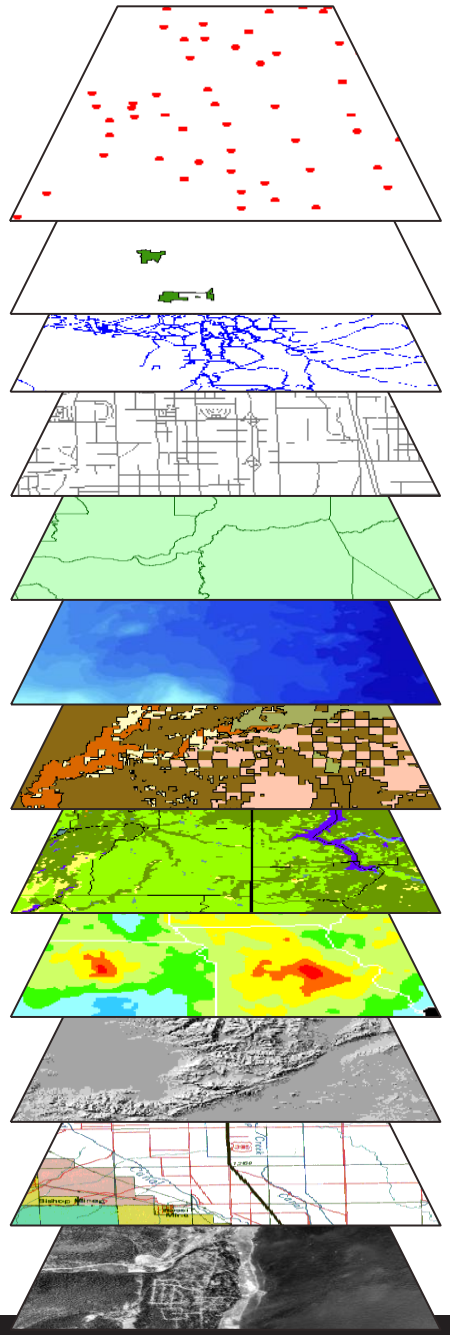
- Key collaborators at Columbia University and the New York City Department of Health and Mental Hygiene include Andrew Rundle, Ofira Schwartz-Soicher, Kathryn Neckerman, Kevin Konty, Bonnie Kerker



Thanks for your attention

gl2225@columbia.edu



Geographic Data Sources

1 km buffer around address linked to data from

- US Census Summary File 3
- NYC Department of City Planning
- NYC Metropolitan Transportation Authority
- NYC Department of Consumer Affairs
- NYC Data Mine
- NYC Parks & Recreation Department
- Mayor's Office of Operations Project Scorecard
- NY Times website
- NY State Department of Transportation