



COMBINED COVID + HEAT RISKS IN NEW YORK CITY

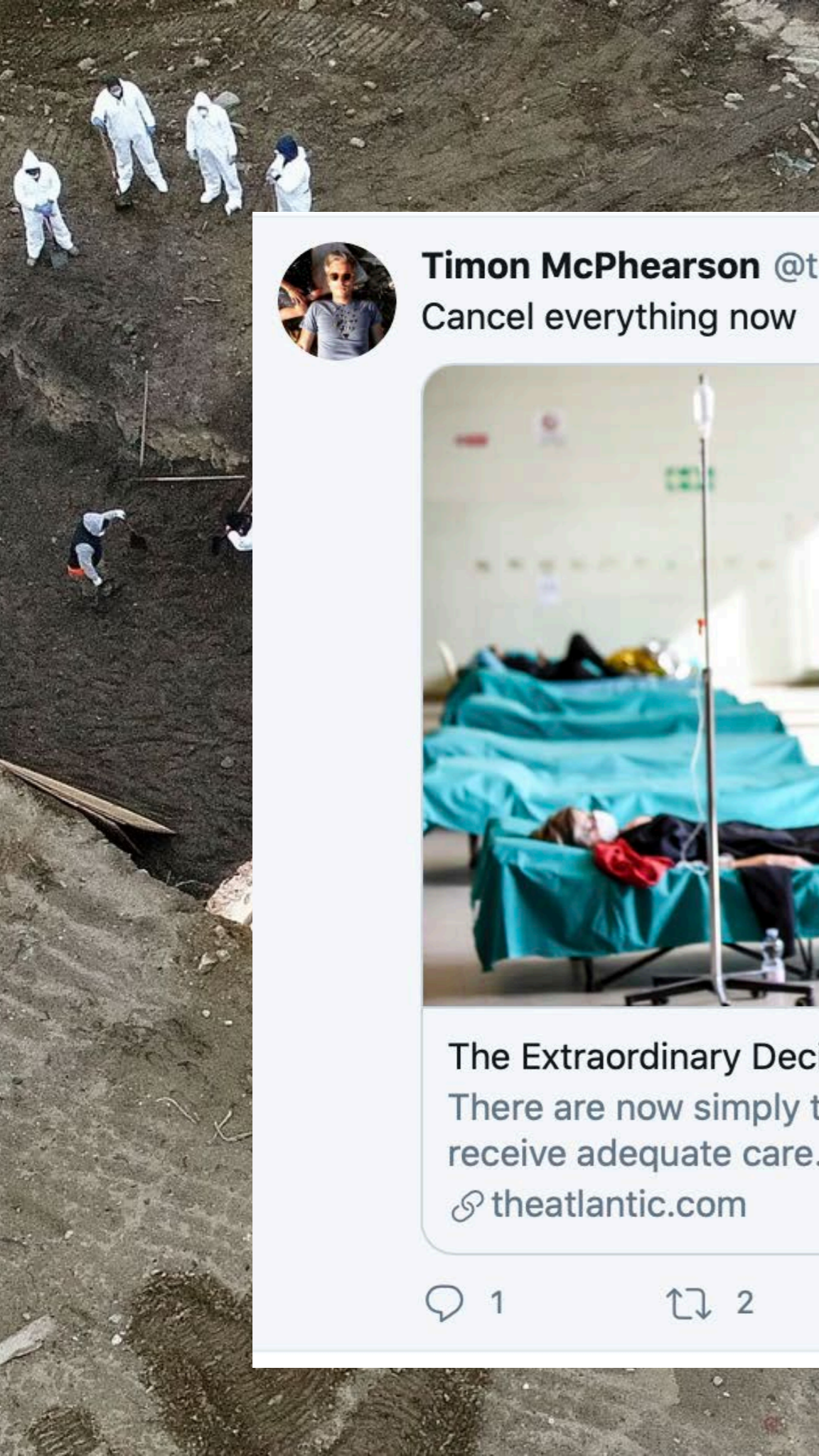
THE
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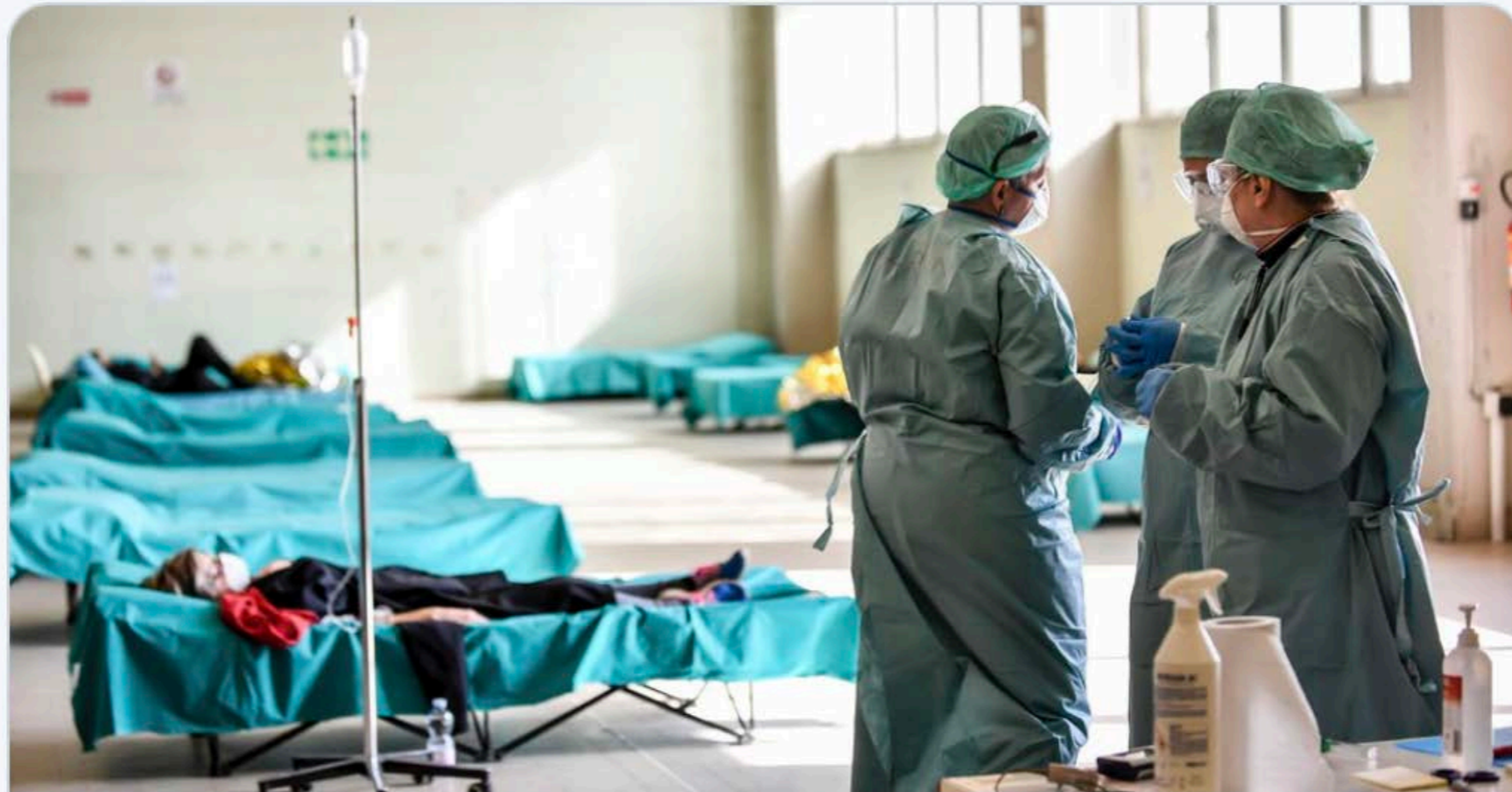
@USL_NYC

URBANSYSTEMSLAB.COM

@TIMONMCPHEARSON



Timon McPhearson @timonmcphearson · Mar 12
Cancel everything now



The Extraordinary Decisions Facing Italian Doctors

There are now simply too many patients for each one of them to receive adequate care.

theatlantic.com



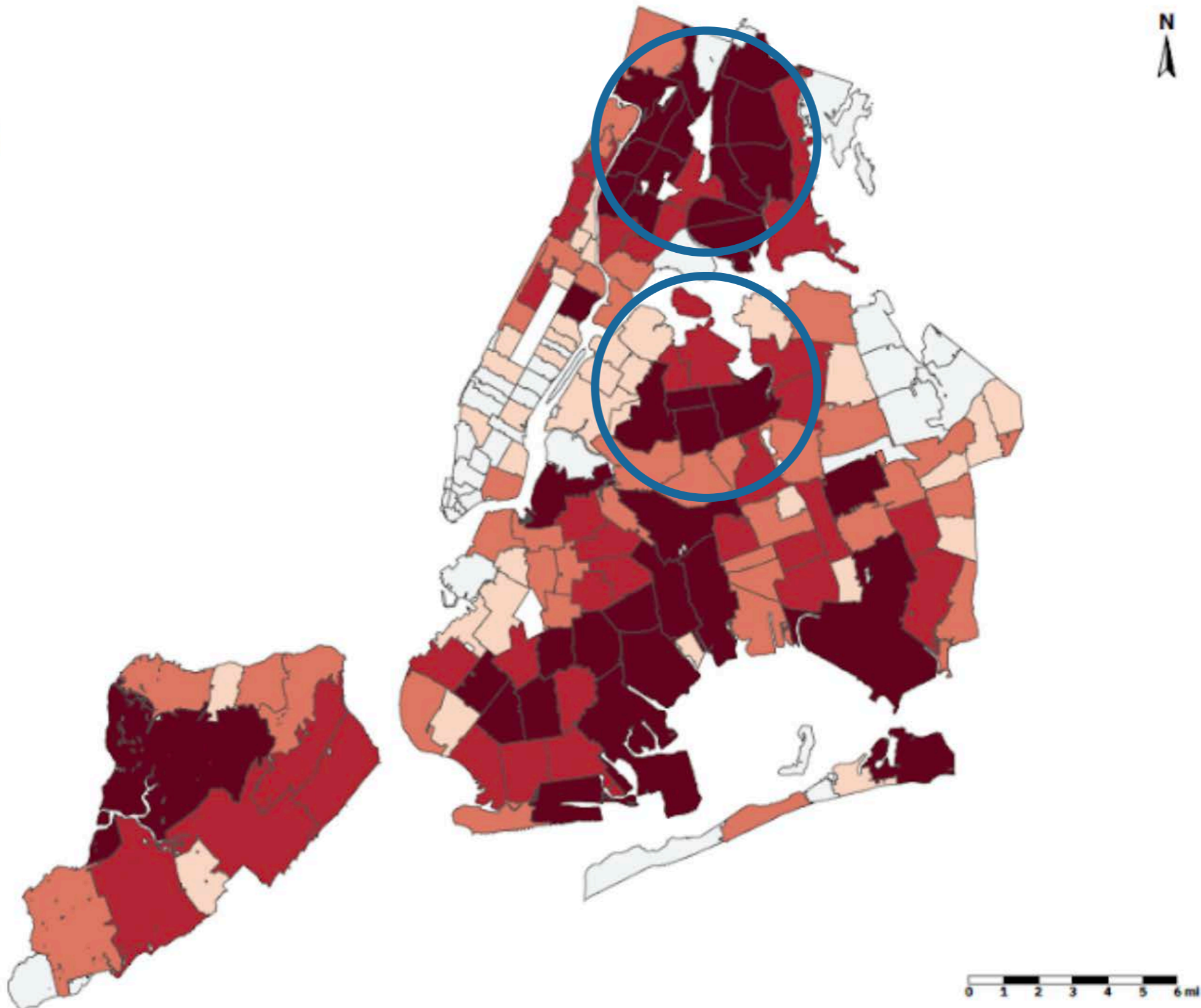
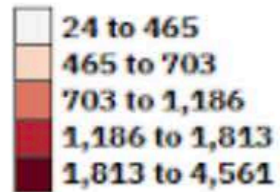
TV

QUESTIONS

- ▶ Who are most vulnerable to direct health impacts of COVID?
- ▶ Will social distancing policies create additional risks from extreme weather such as heat waves?
- ▶ How might COVID and heat risks interact and even compound each other?

CONFIRMED COVID CASES IN NEW YORK CITY

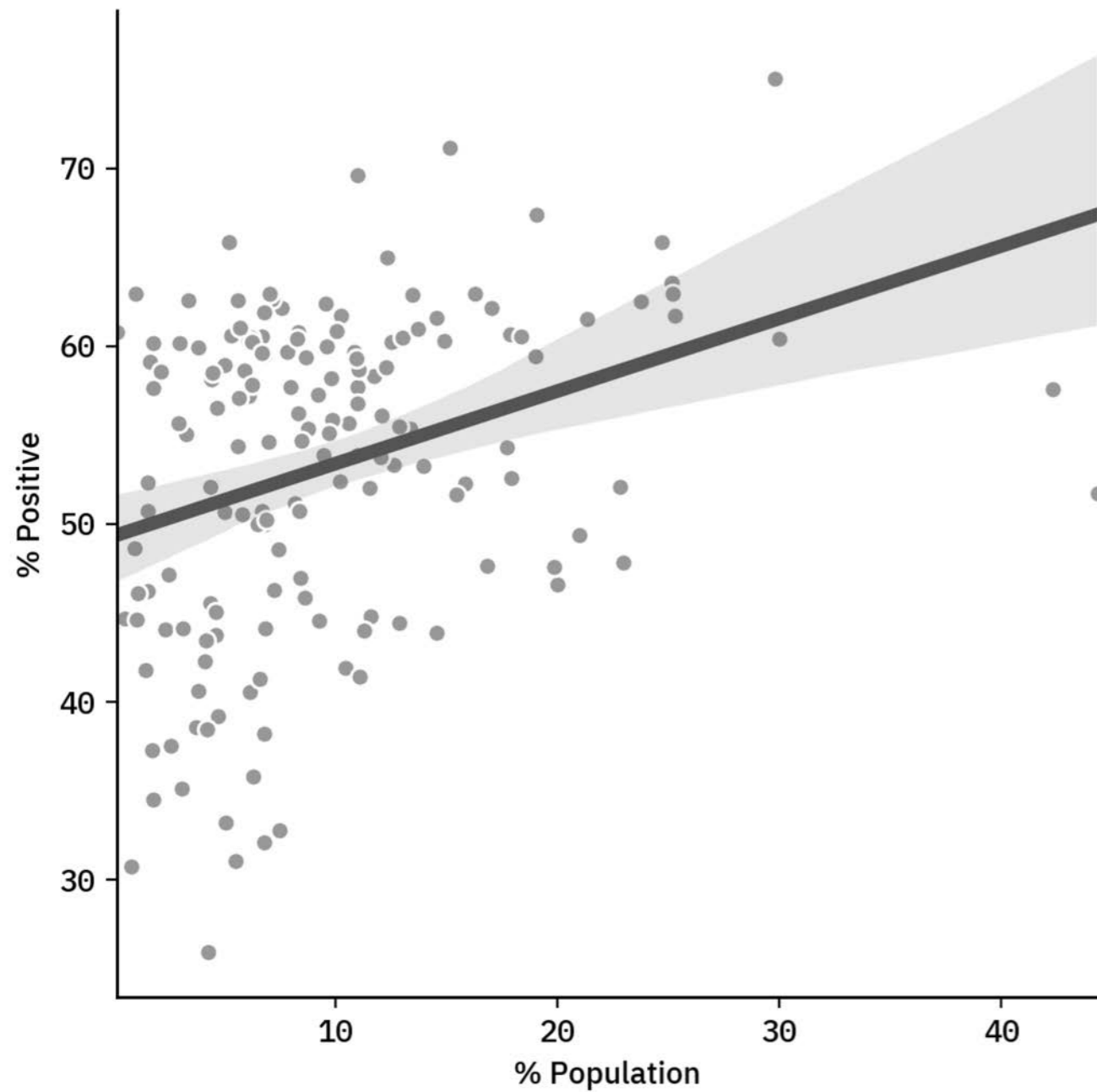
estimate



MORE CASES AMONG THE UNINSURED

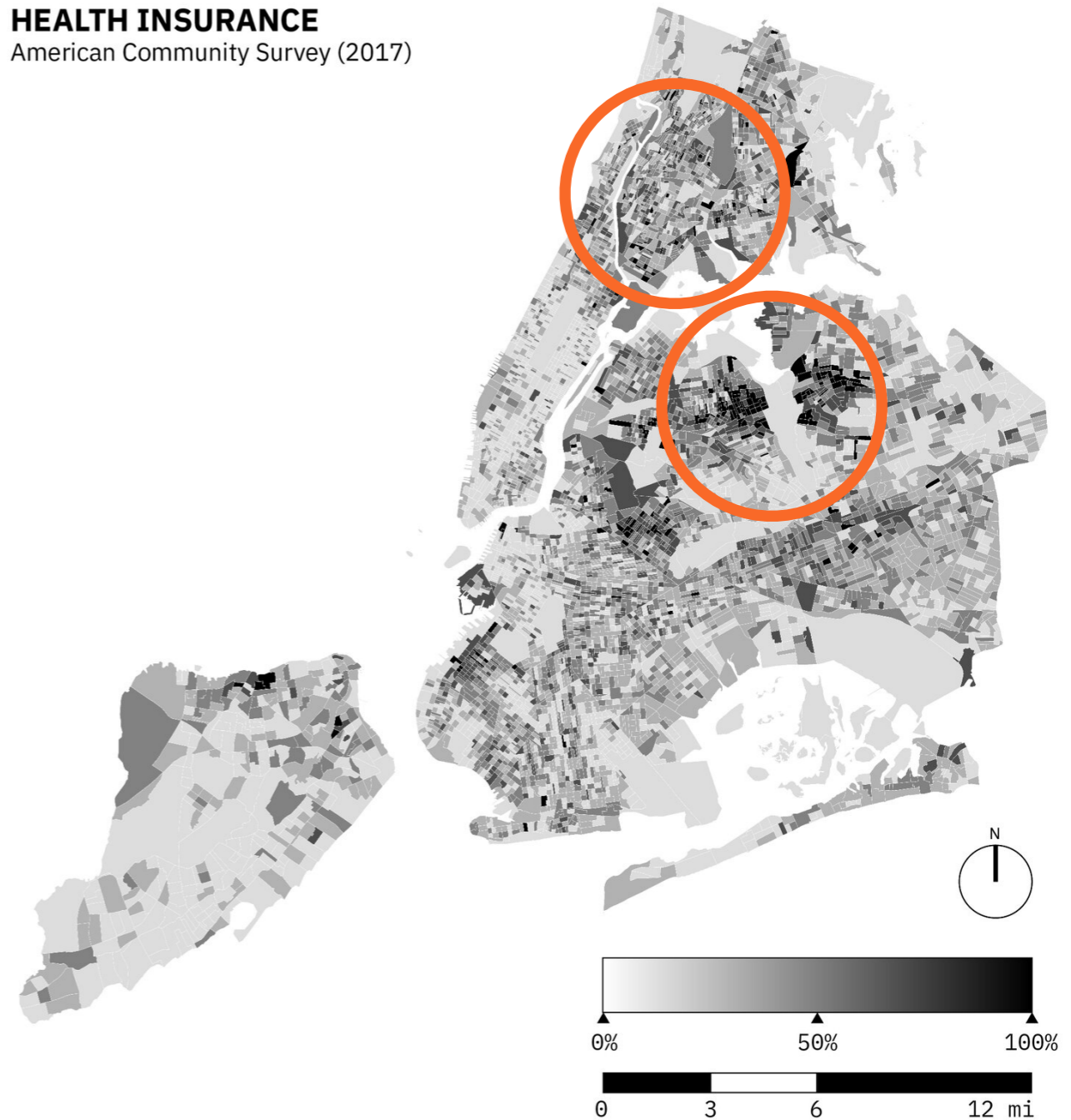
% OF PEOPLE WITHOUT HEALTH INSURANCE

Data Source: American Community Survey (2017)



POPULATION WITHOUT HEALTH INSURANCE

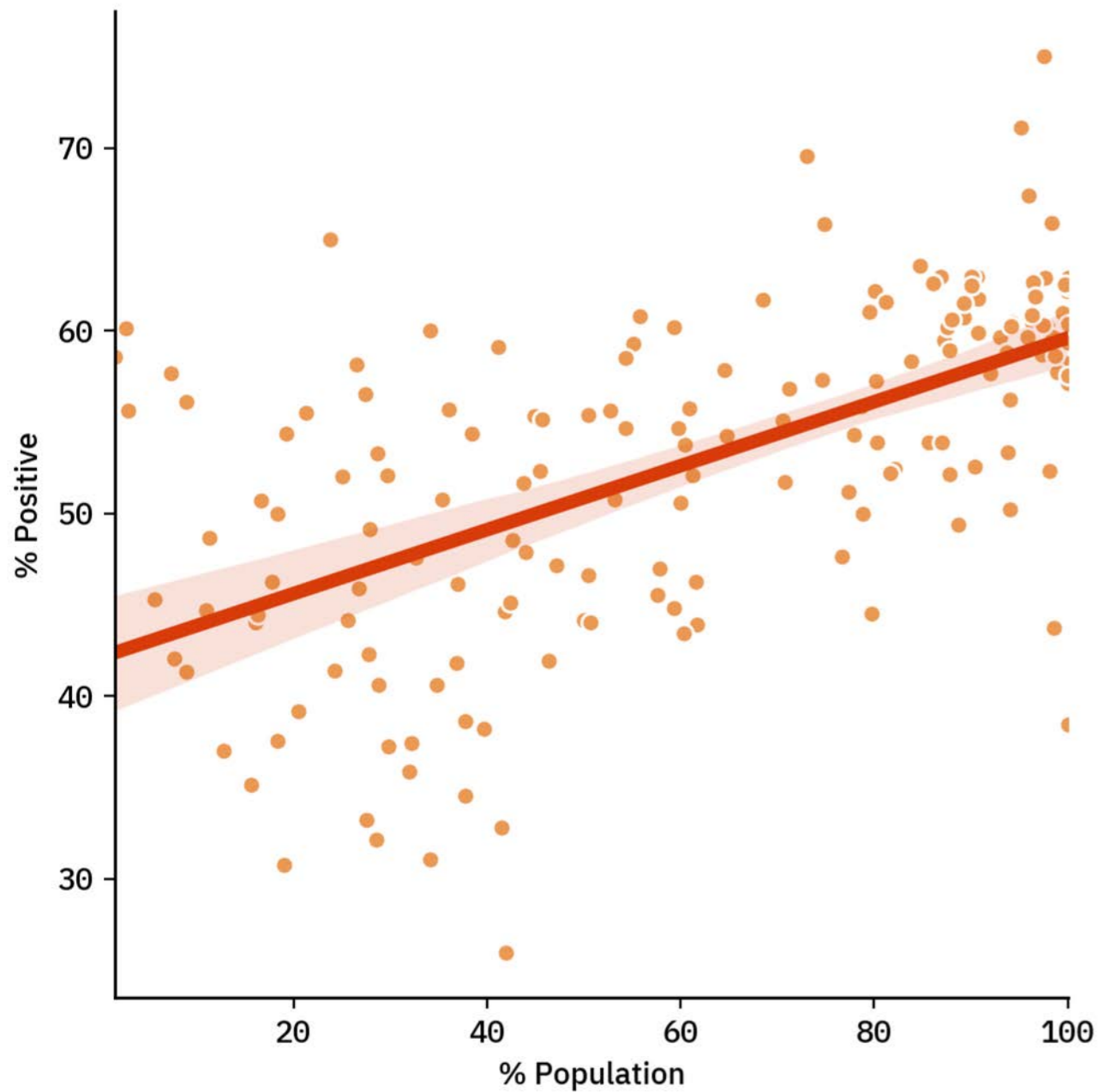
American Community Survey (2017)



COMMUNITIES OF COLOR ARE MOST AFFECTED

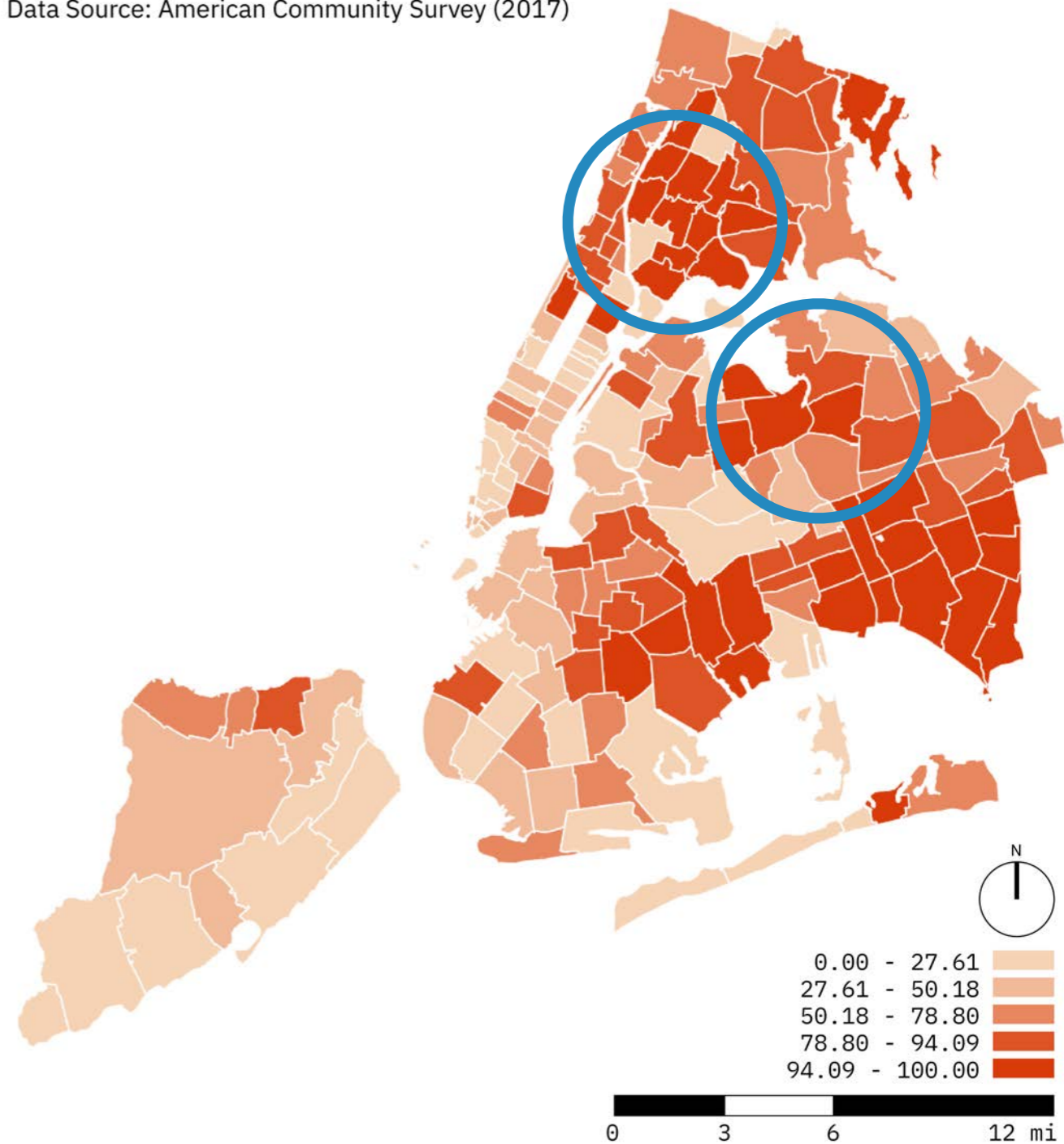
% OF PEOPLE OF COLOR

Data Source: American Community Survey (2017)



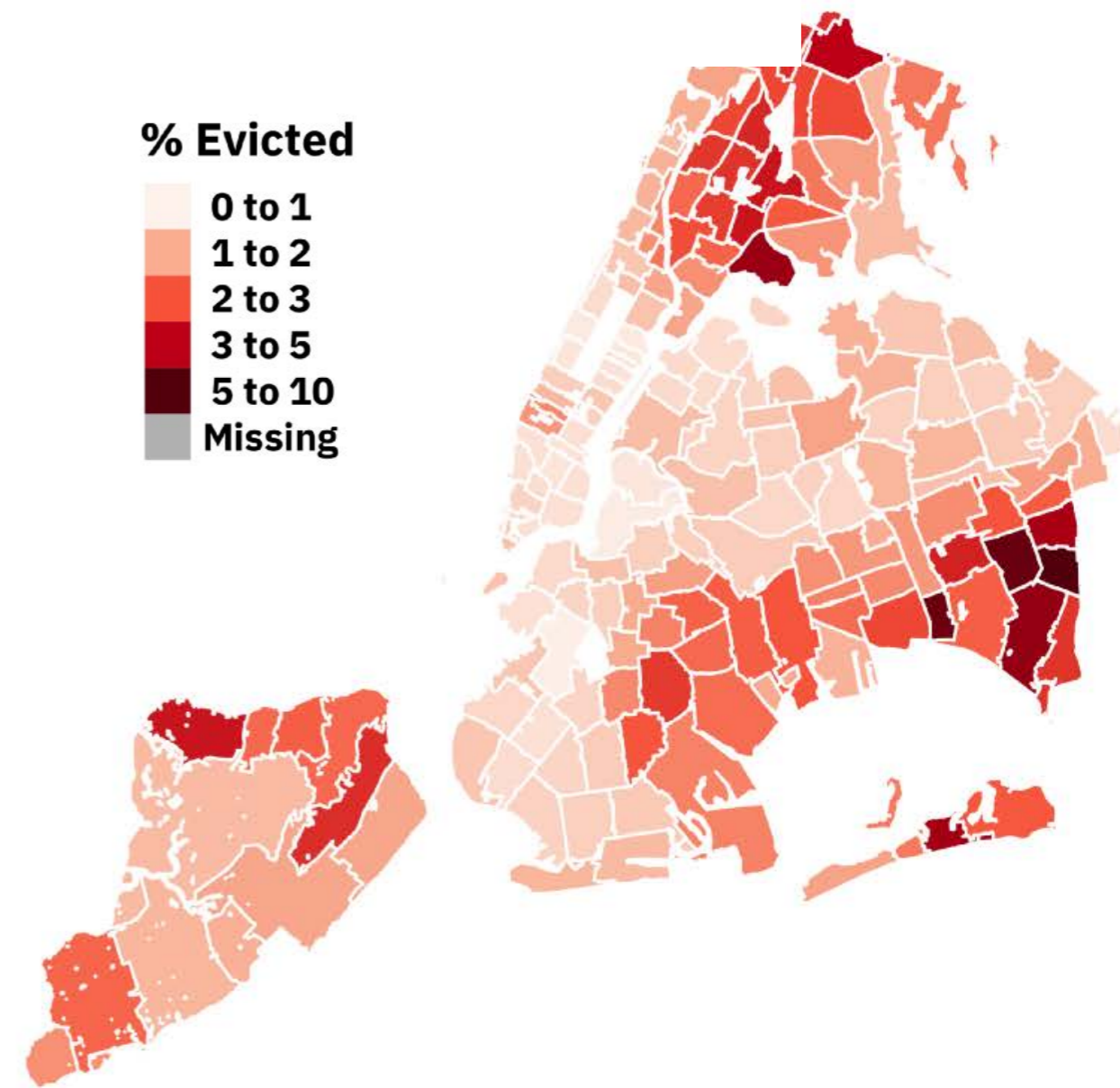
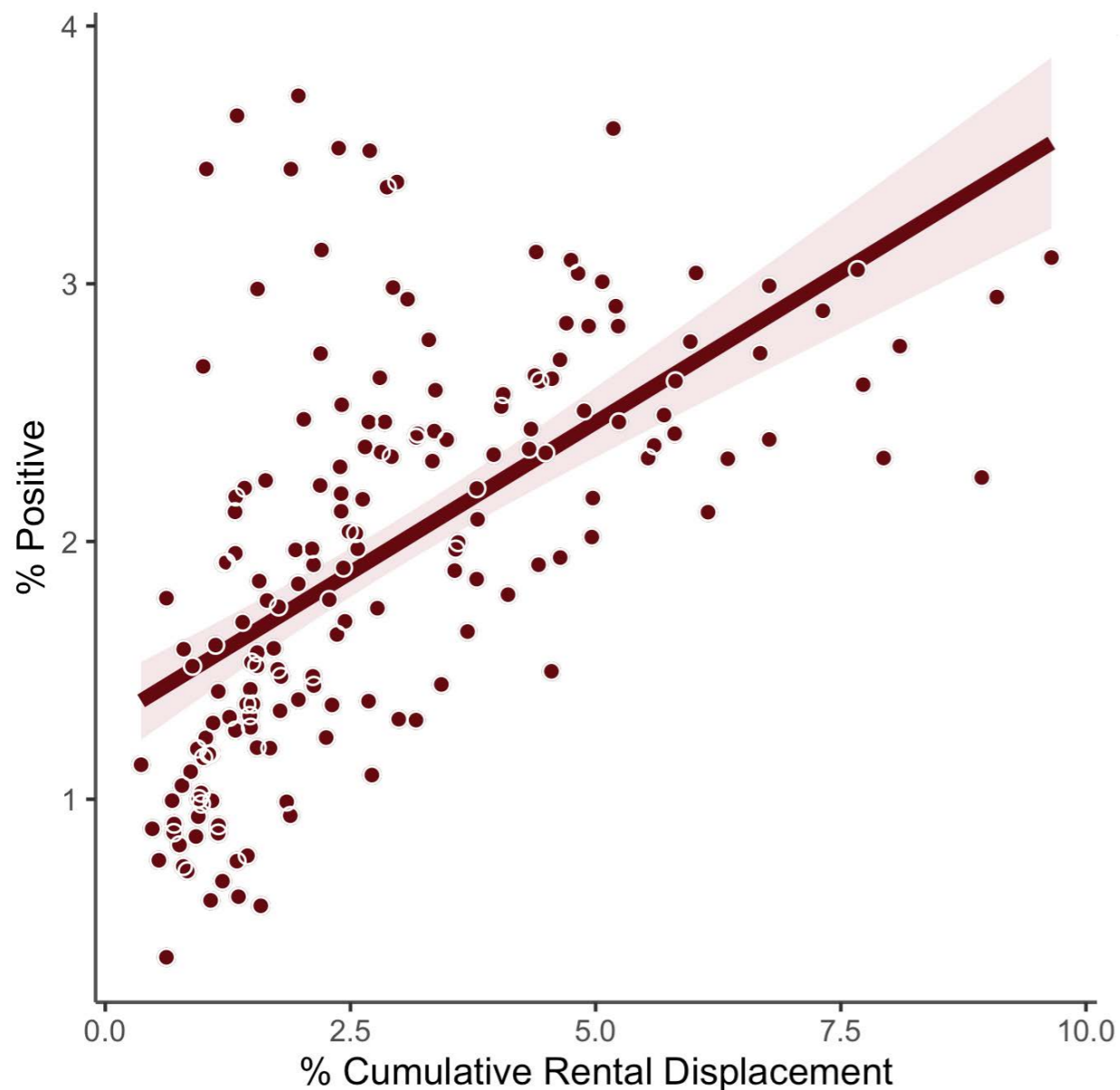
% OF PEOPLE OF COLOR

Data Source: American Community Survey (2017)



WHAT ABOUT ECONOMIC IMPACTS?

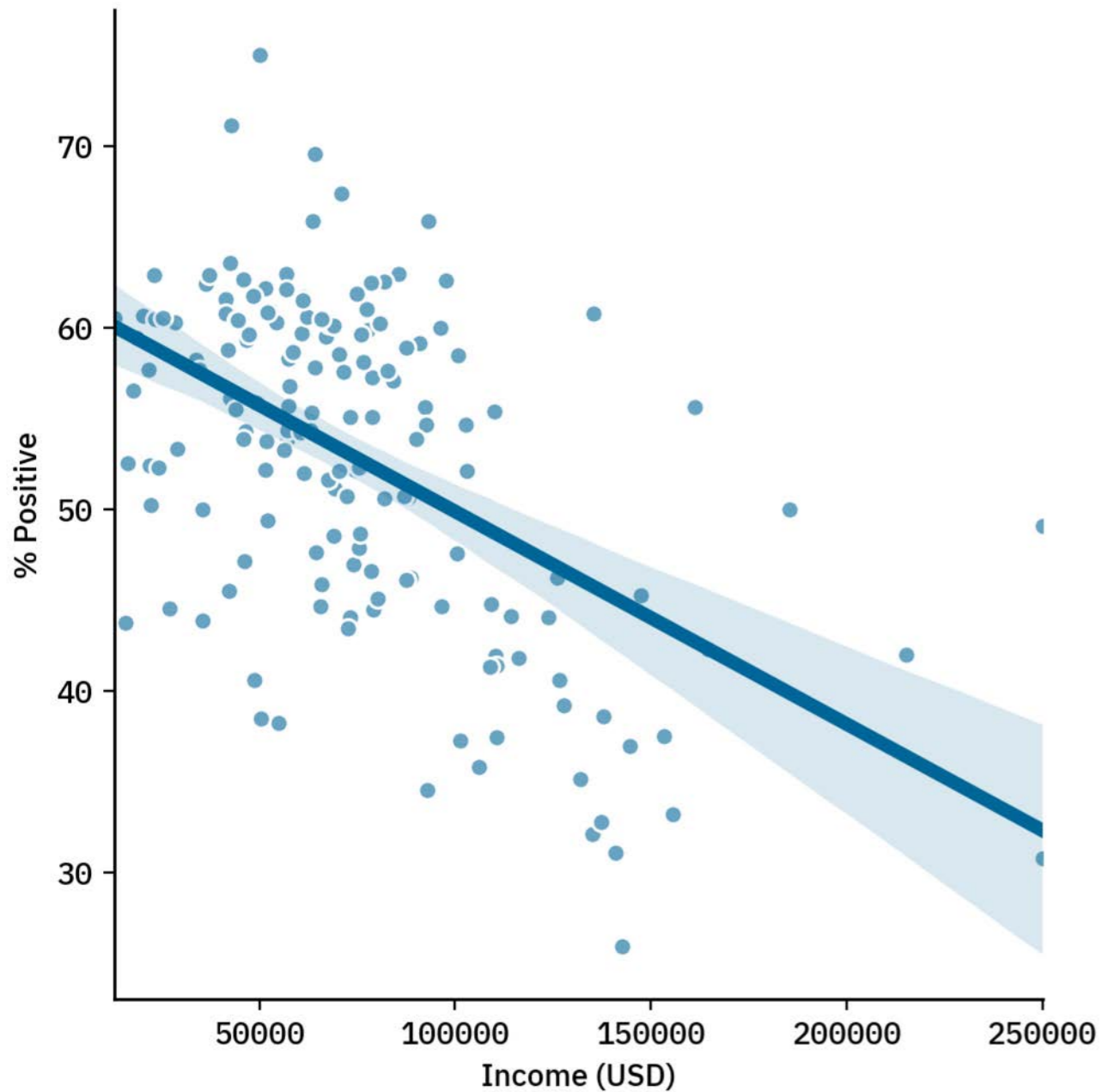
ESTIMATED CUMULATIVE RENTAL DISPLACEMENT 2017 - present, by Zip Code



THE POOR ARE BEING HIT HARD BY COVID

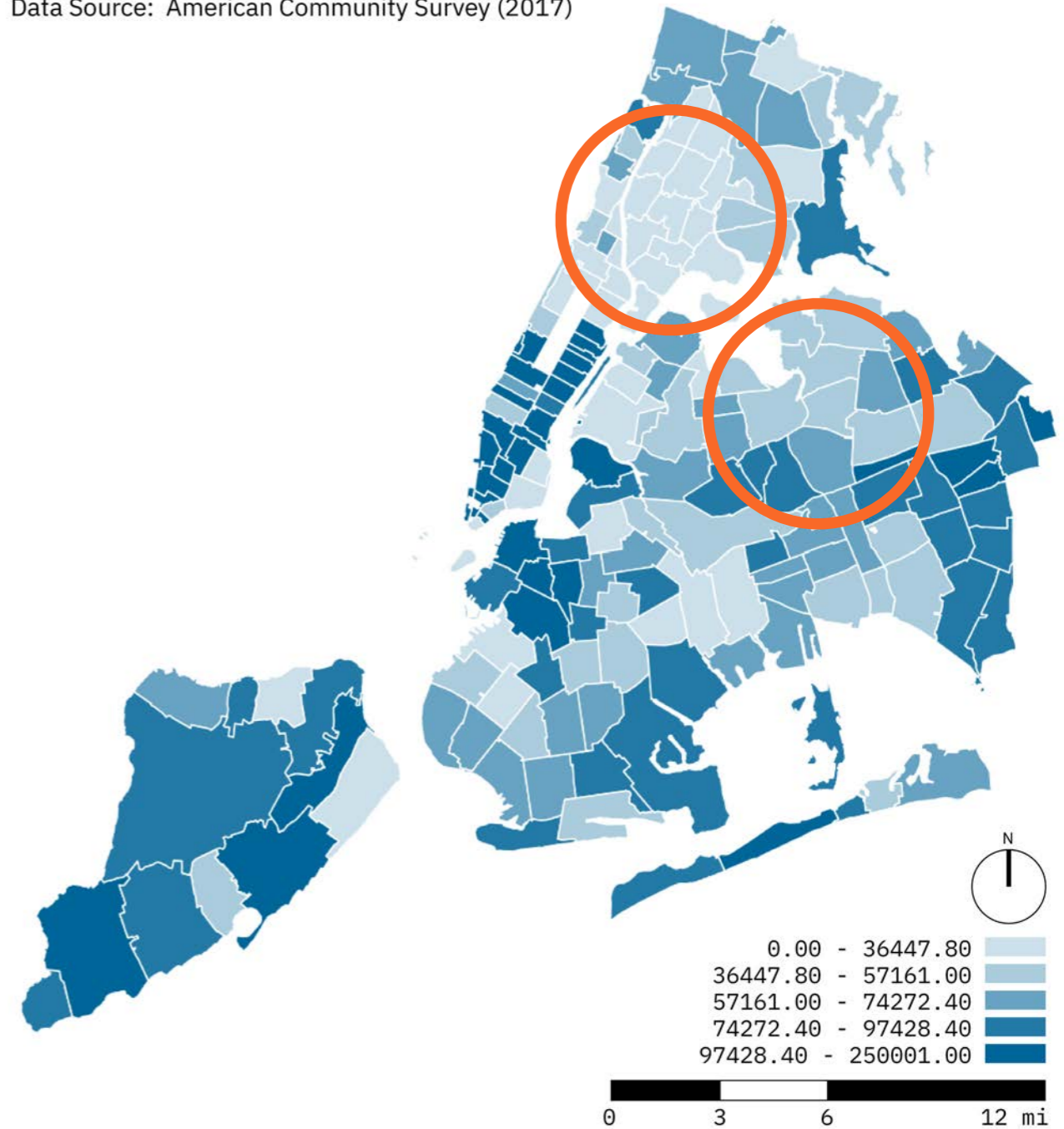
HOUSEHOLD MEDIAN INCOME

Data Source: American Community Survey (2017)

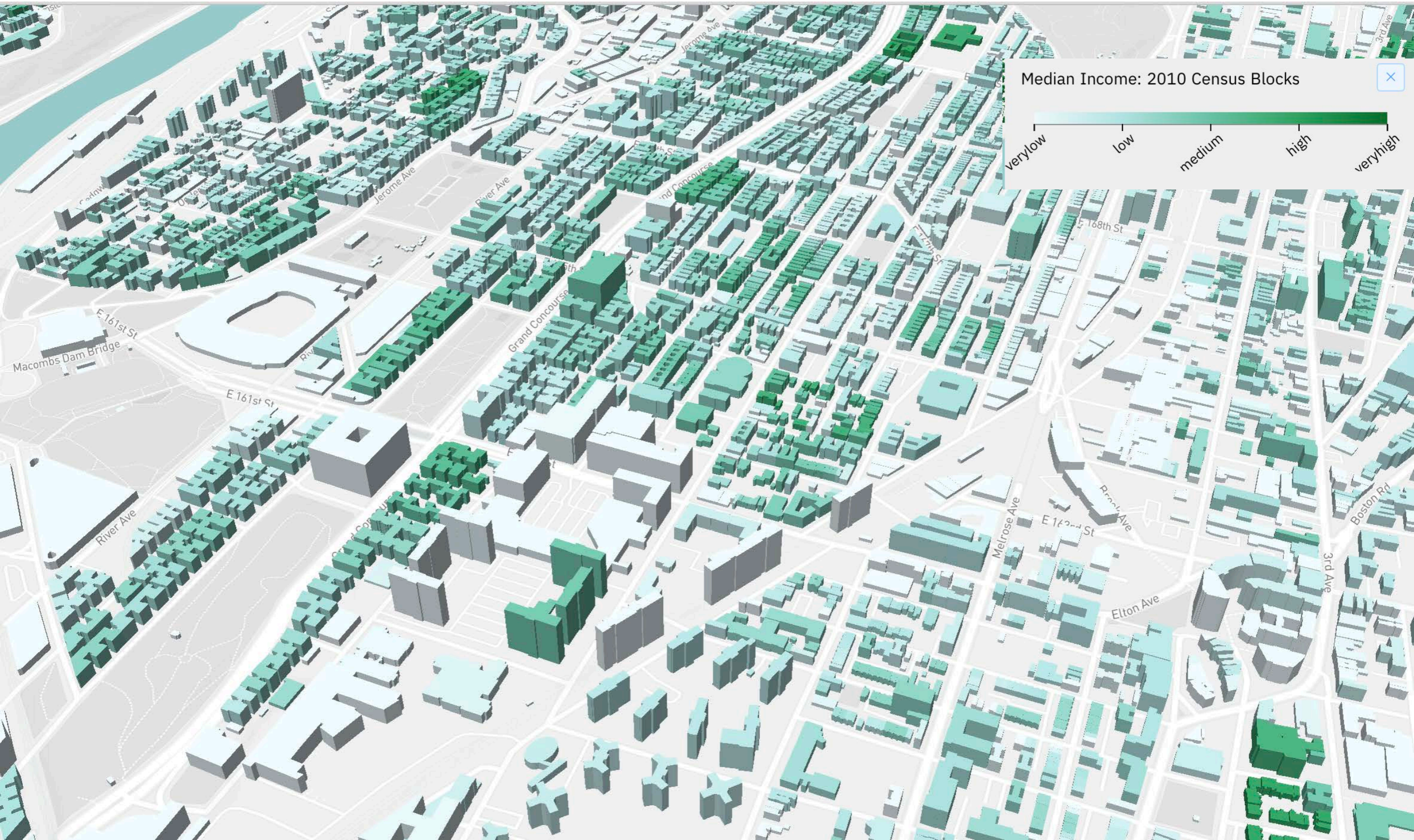


HOUSEHOLD MEDIAN INCOME

Data Source: American Community Survey (2017)



WHERE THE LOW INCOME LIVE IN NEW YORK CITY



WHERE THE LOW INCOME LIVE IN NEW YORK CITY

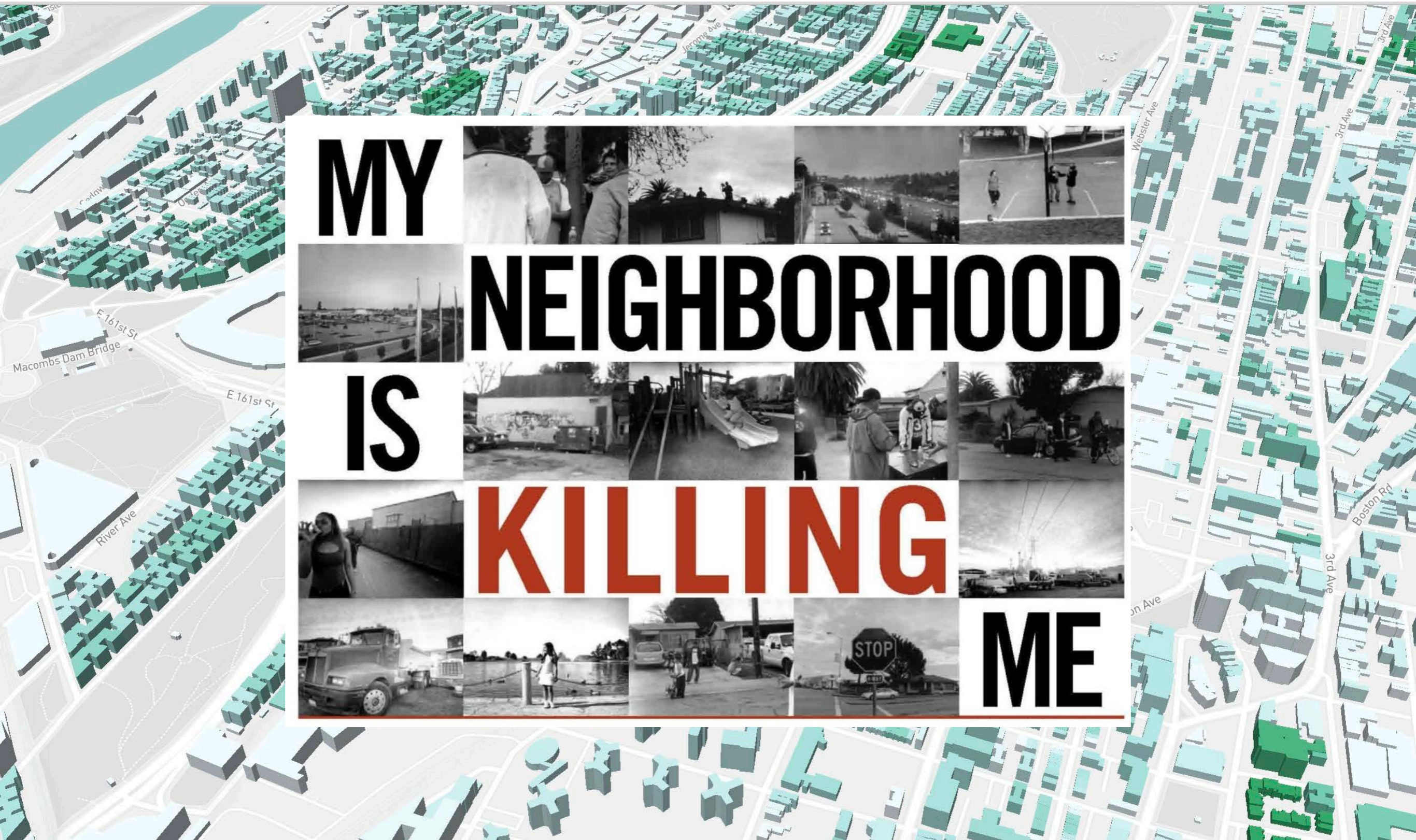


IMAGE: CUNY Center for Urban Environmental

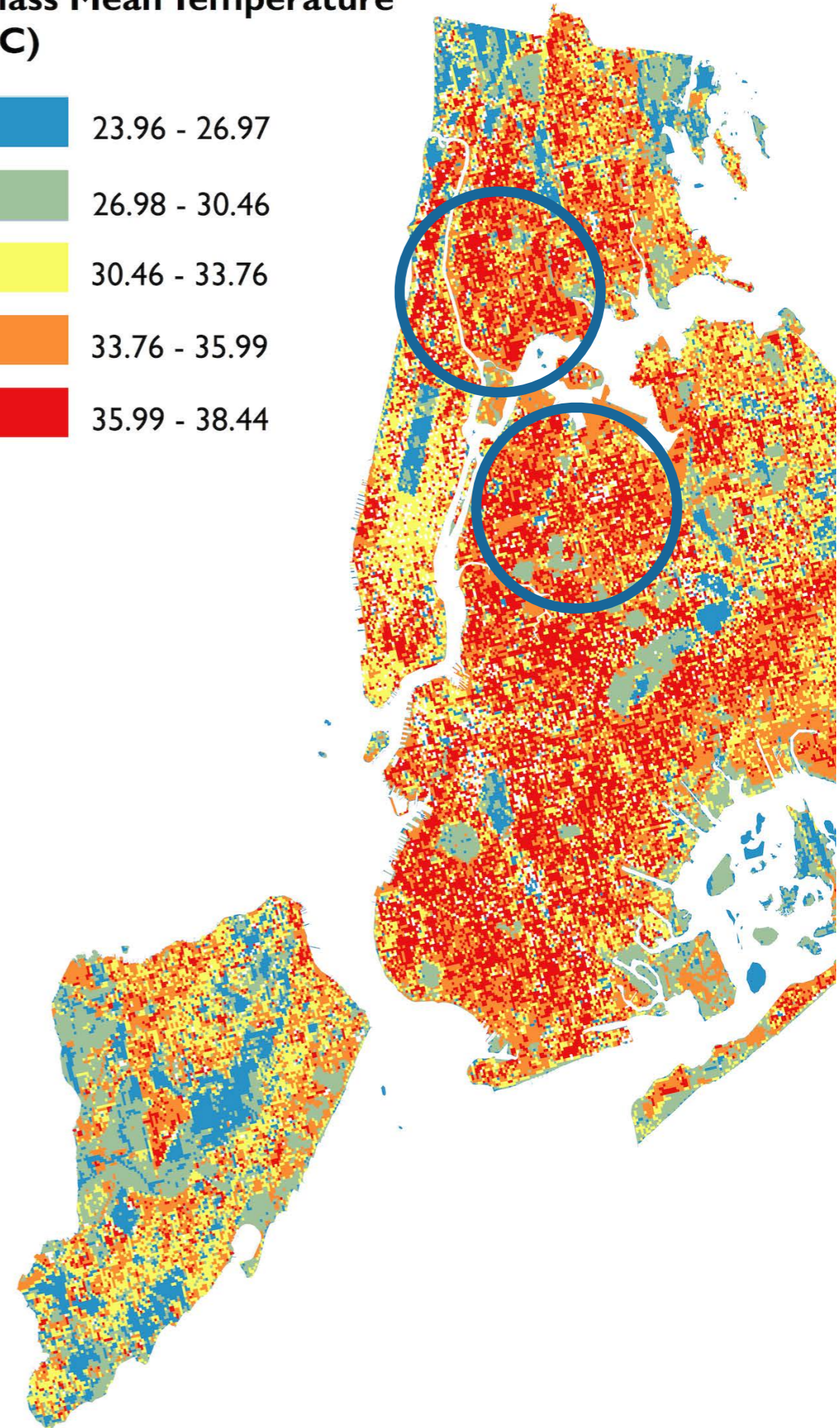
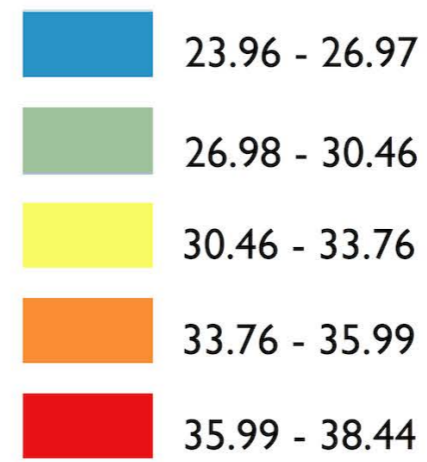


COVID-CLIMATE

**OVERLAPPING
RISKS?**



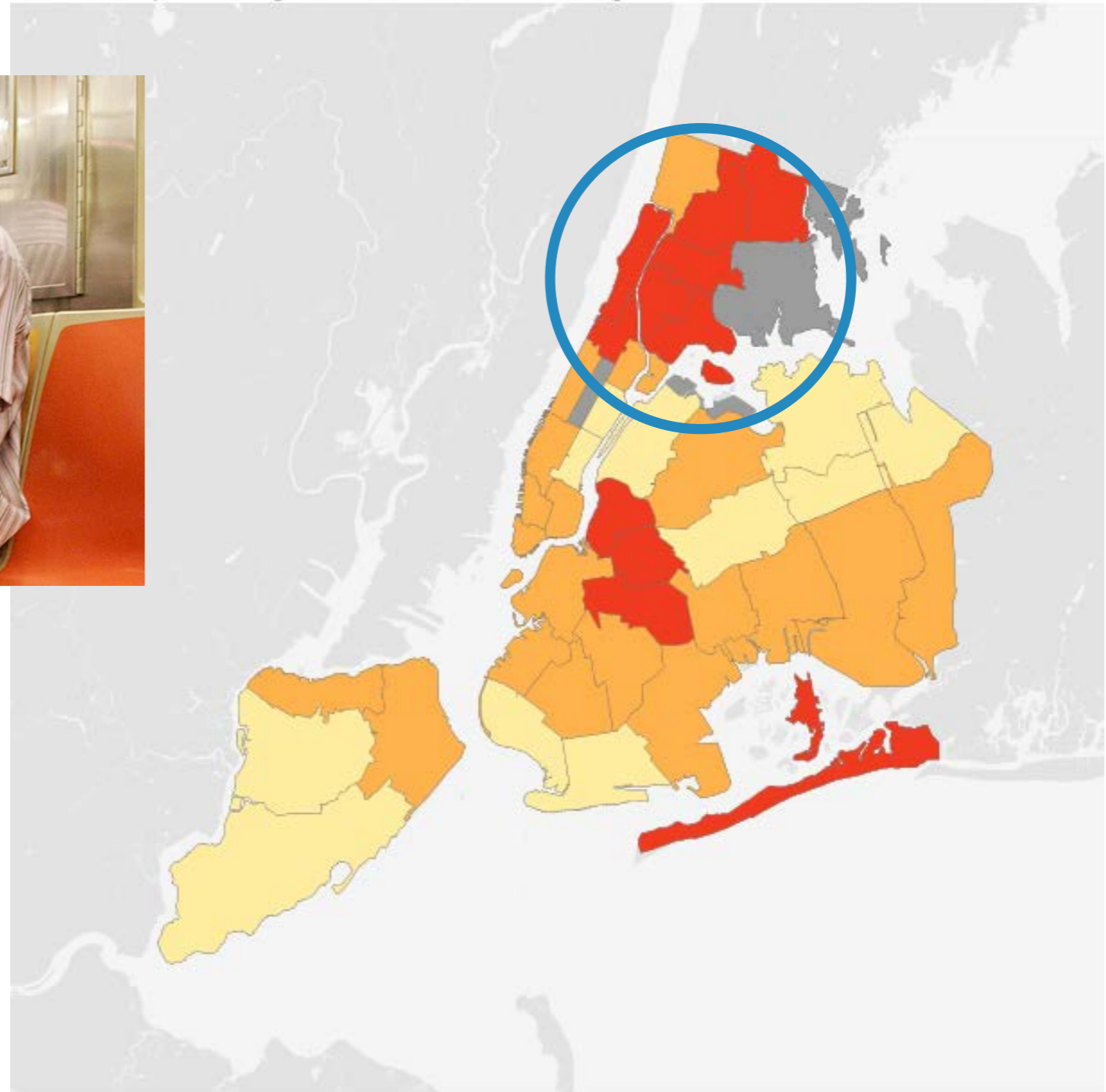
Class Mean Temperature (°C)



THE PRESENT

LACK OF AIR CONDITIONING

New York City seniors age 65+ without air conditioning



2007

Percent without air-conditioning (%)

no data	5 - 14	14 - 25	25 - 43
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NOAA Climate.gov

New-York Daily Times.

VOL. I...NO. 267.

NEW-YORK, TUESDAY, JULY 27, 1852.

PRICE ONE CENT.

a few dimes as a present, and that they often are constrained to pay their demands, that they may retain the good will of the bands to which they belong.

Kursaal, the common meeting-place for strangers. This is a large building of Grecian architecture, which you enter by a noble portico of six lofty

policy for the speediest possible union between the Provinces and the United States; for the fisheries are so important to our navigating and naval interests that we cannot possibly yield the share we

part of the lake; sixteen hundred weight being caught by three men during six weeks. As to game, I inquired if they took any moose about

The Streets in Midsummer.

There they lie! The sun beating down upon them all day long, until the stones are individually as hot as frying-pans; and the gratings, as you inadvertently set your foot upon them, appear to be of the proper temperature to repeat the martyrdom of St. LAWRENCE on an unfortunate victim.

The brick walls of the houses reflect the hottest of rays on the pavement, and the pavement returns them with such good interest, that the wayfarer realizes all the wretchedness of passing between two fires. The burning plough-shares of mediæval times were no circumstance to the flags of Broadway. The streets have the agreeable temperature of the grooves, which some gigantic Vulcan has been rinsing out with molten iron.



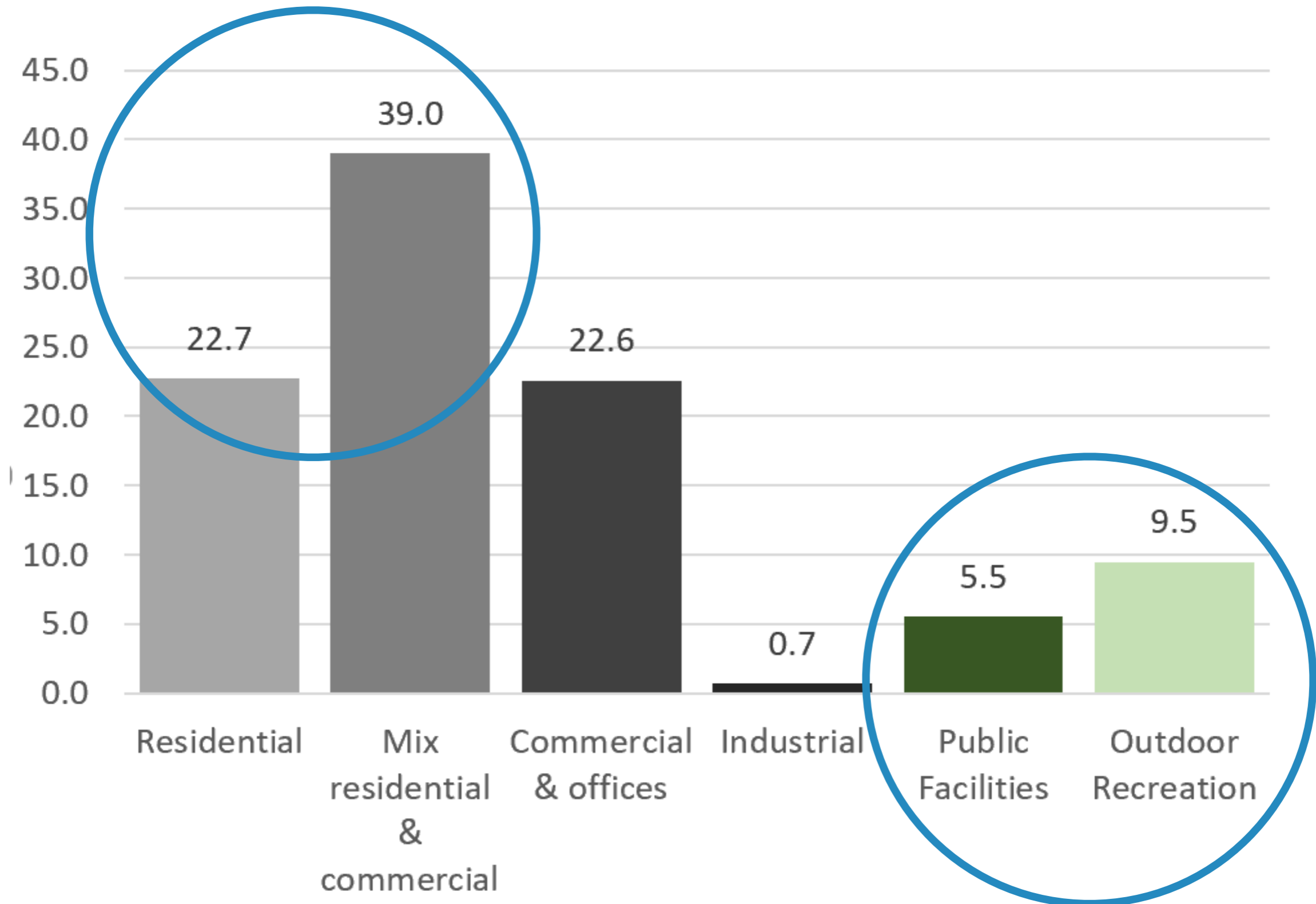
SOCIAL DISTANCING
POLICIES

COVID IMPACTS
ON URBAN LIFE

U.S. COVID-19 POLICIES

- ▶ Stay at Home Orders
- ▶ Mandatory Quarantine for Travelers
- ▶ Large Gathering Bans
- ▶ State-Mandated School Closures
- ▶ Restaurant/Bar Limits
- ▶ Primary Election Postponement
- ▶ State of Emergency Declarations

TWITTER DATA SHOWS EVIDENCE OF SOCIAL DISTANCING



NYC Twitter Activity April 1-15, 2020

The Nature
Conservancy 

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BHC
BUILDING
HEALTHY
COMMUNITIES

 NYS HEALTH
FOUNDATION
Improving the state of New York's health



KEEP THIS FAR APART

URBAN PARKS & OPEN SPACES DURING COVID-19 NYC SURVEY

urbansystemslab.com/covid19

BEHAVIOR CHANGE

Since the start of the Covid-19 crisis, how has your participation in the following activities changed compared to what you did before?

INCREASED

Visiting parks/open space: **42%**

Using NYCHA Open Spaces: **46%**

Going Walks: **50%**

Outdoor Recreation: **32%**

Outdoor Exercise: **34%**

Gardening: **39%**

Birdwatching: **44%**

Caring for indoor plants: **38%**

Observing nature: **67%**

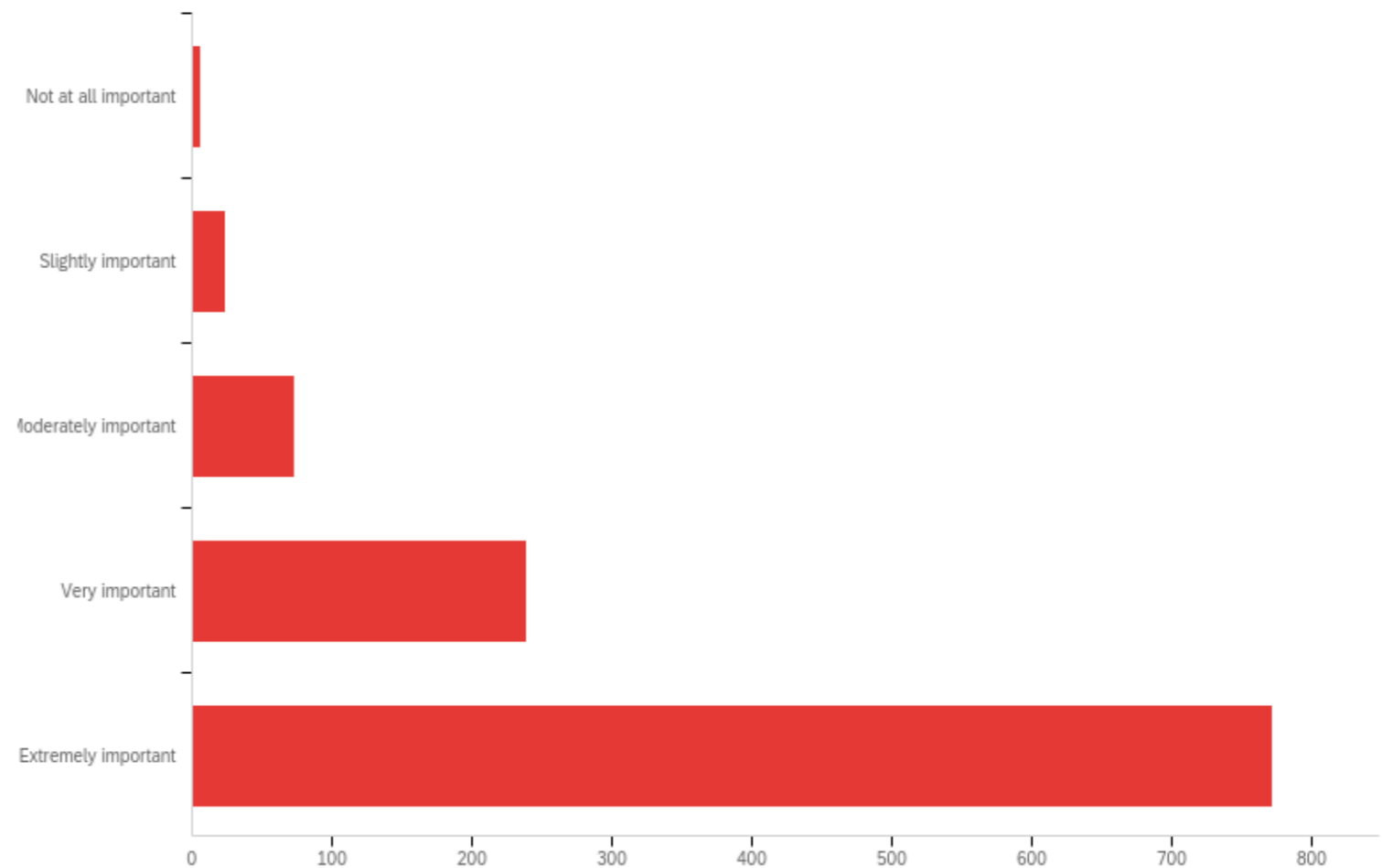
Fishing/hunting: **16%**

MENTAL HEALTH

Currently, how important do you think parks and open space are for your **mental health**?

IMPORTANCE

- **Extremely important: 69%**
- **Very important: 21%**

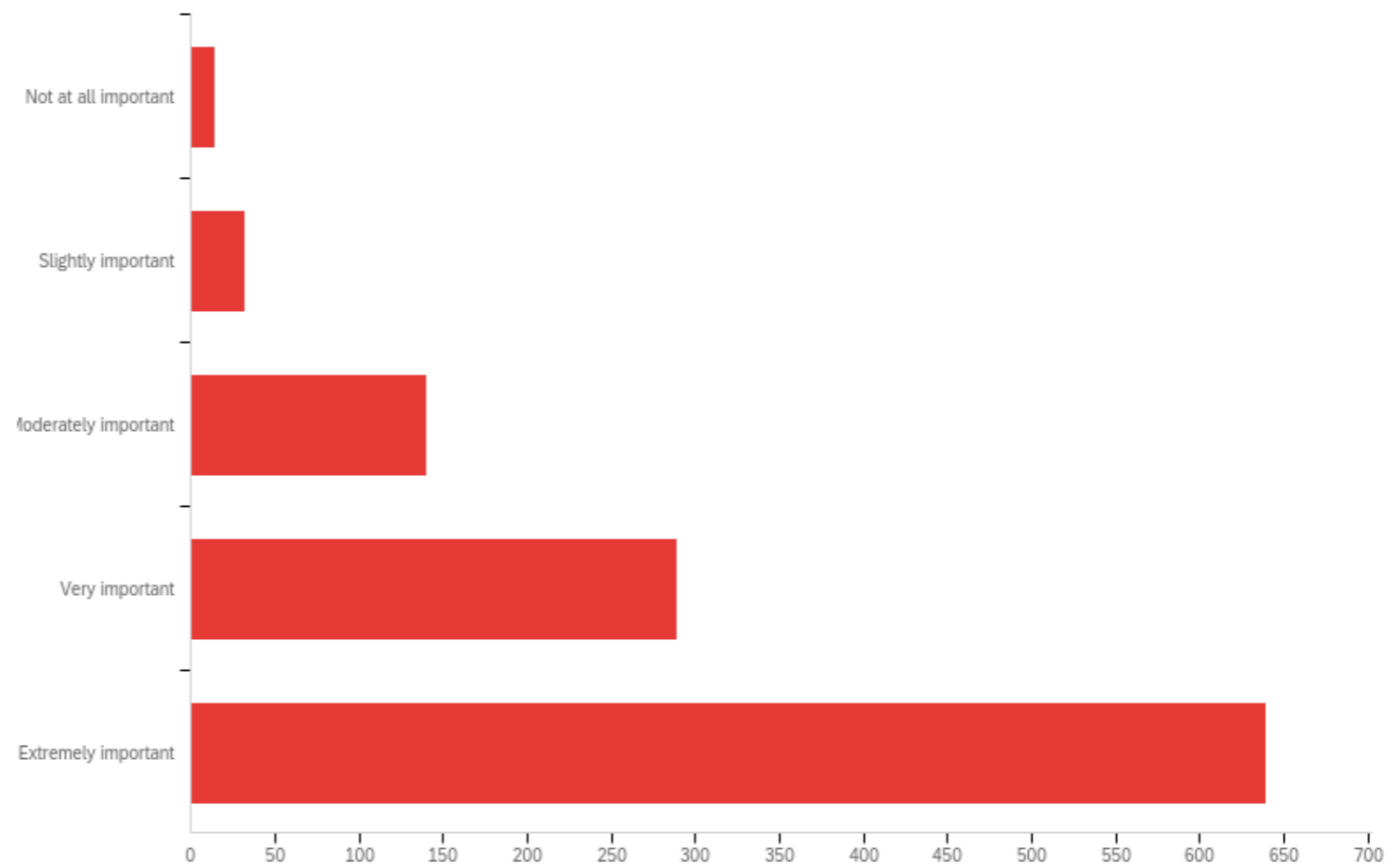


PHYSICAL HEALTH

Currently, how important do you think parks and open space are for your **physical health**?

IMPORTANCE

- **Extremely important: 57%**
- **Very important: 26%**



STRESS CHANGE

The last time you visited a park or open space, how did it affect your stress level?

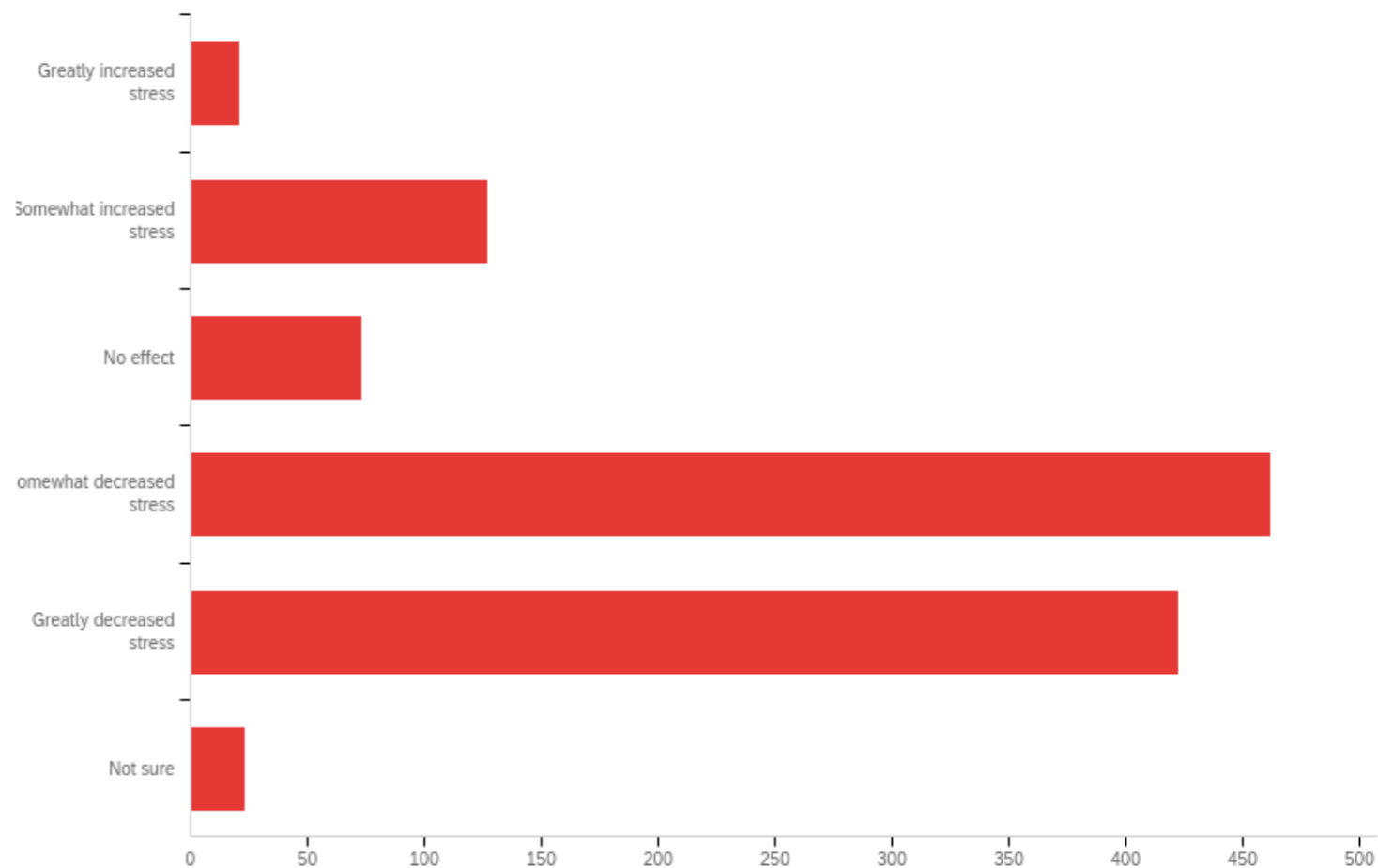
Change in Stress

Greatly decreased

stress: 38%

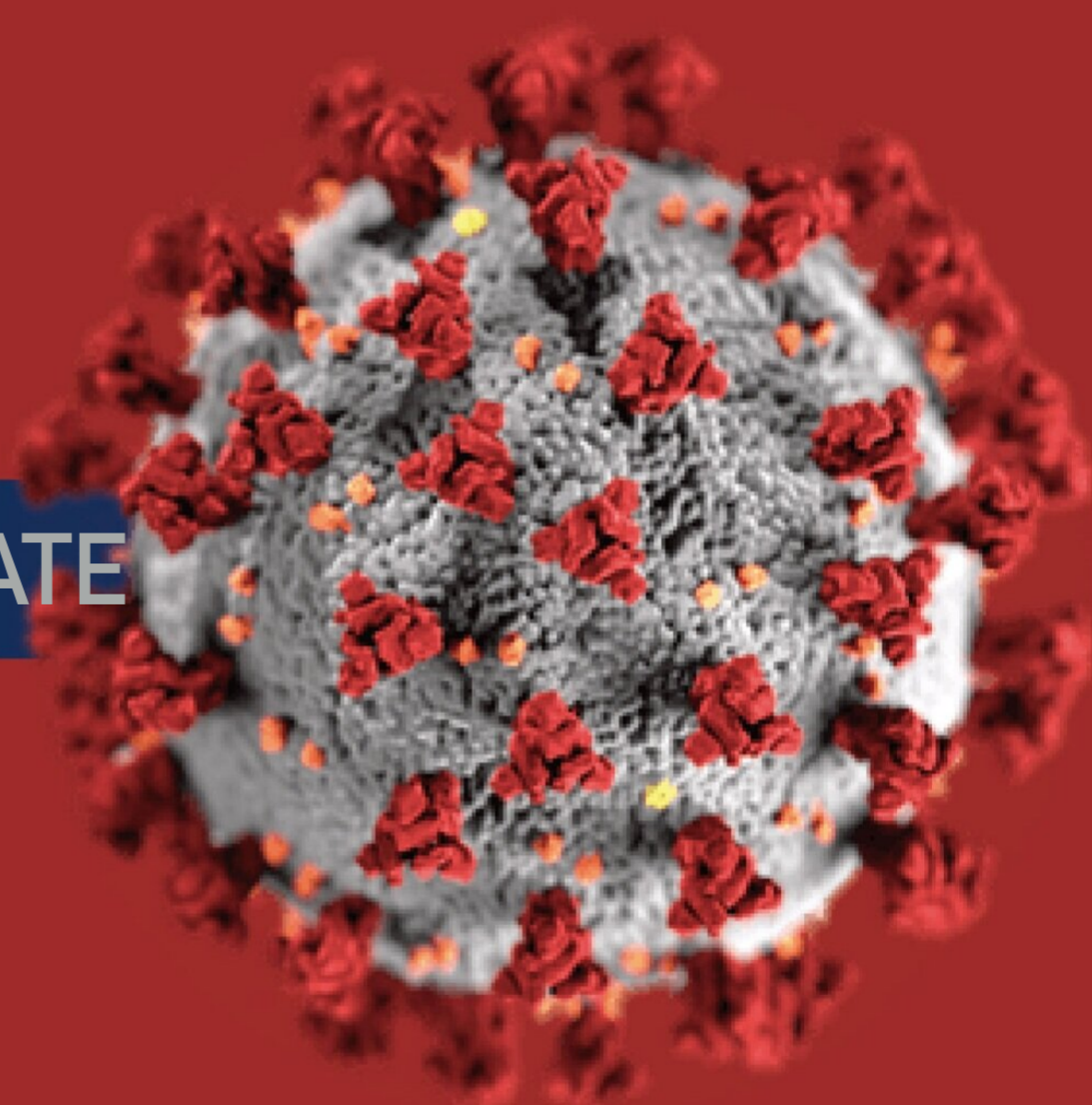
Somewhat decreased

stress: 41%





COVID-CLIMATE

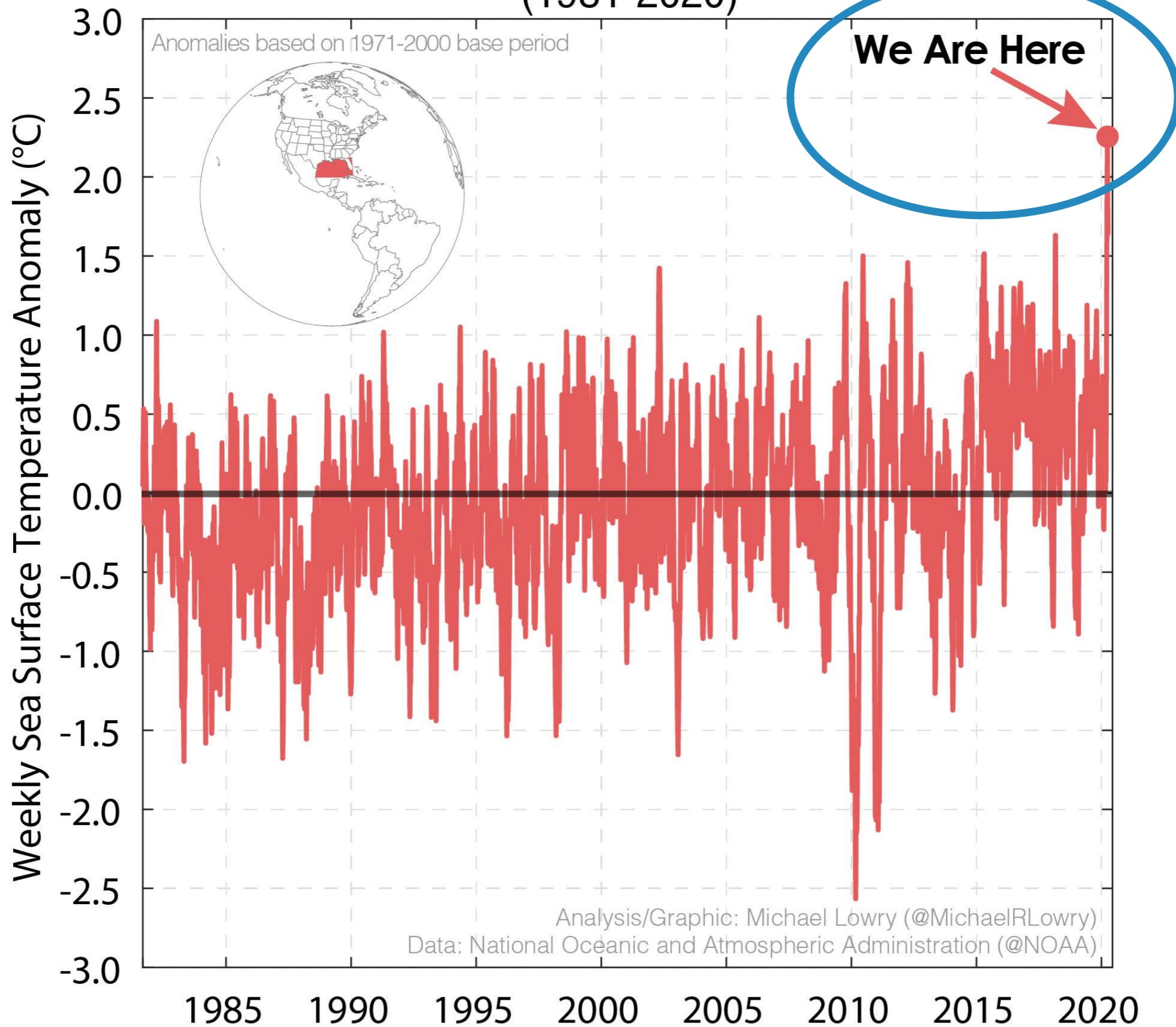


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INTERDEPENDENT RISKS?

McPhearson, Mustafa and Ortiz. "Heat and coronavirus can be twin killers" *Nature* 582, 32 (2020)

Gulf of Mexico Weekly Sea Surface Temperature Anomaly (1981-2020)



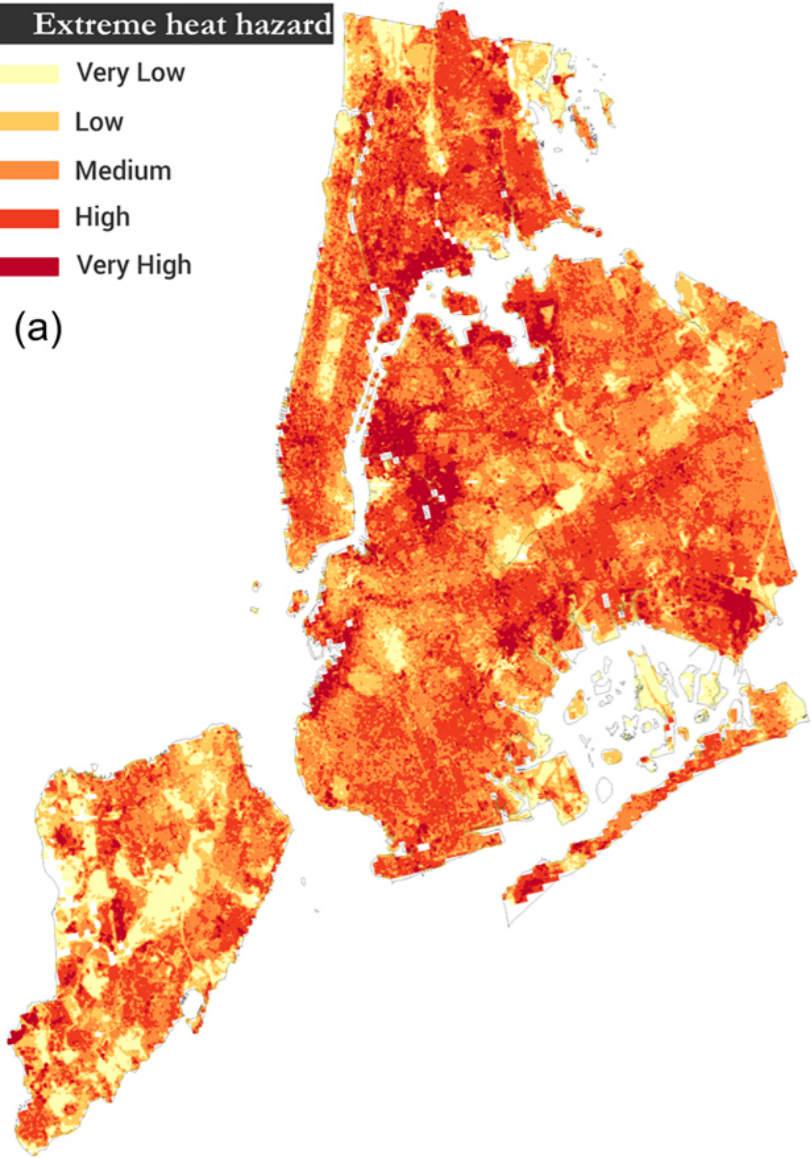
MULTI-HAZARD RISK IN NEW YORK CITY

Heat

Extreme heat hazard

- Very Low
- Low
- Medium
- High
- Very High

(a)

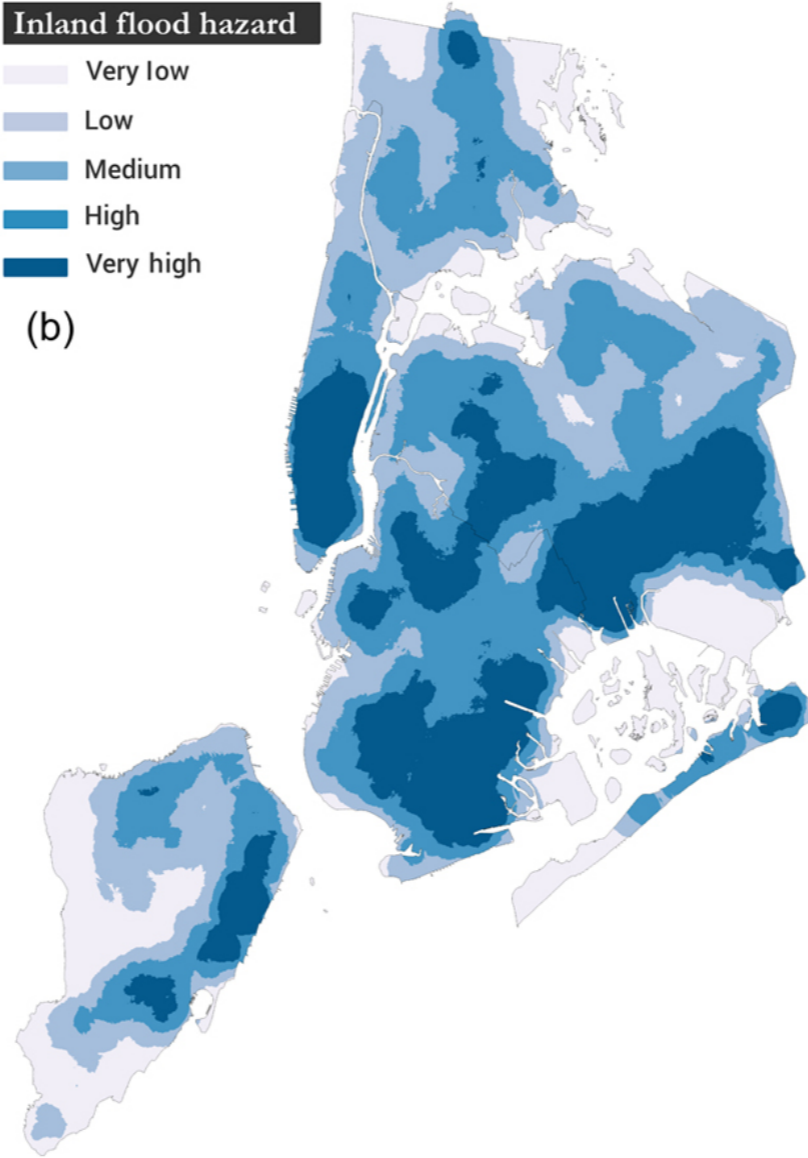


Inland Flooding

Inland flood hazard

- Very low
- Low
- Medium
- High
- Very high

(b)

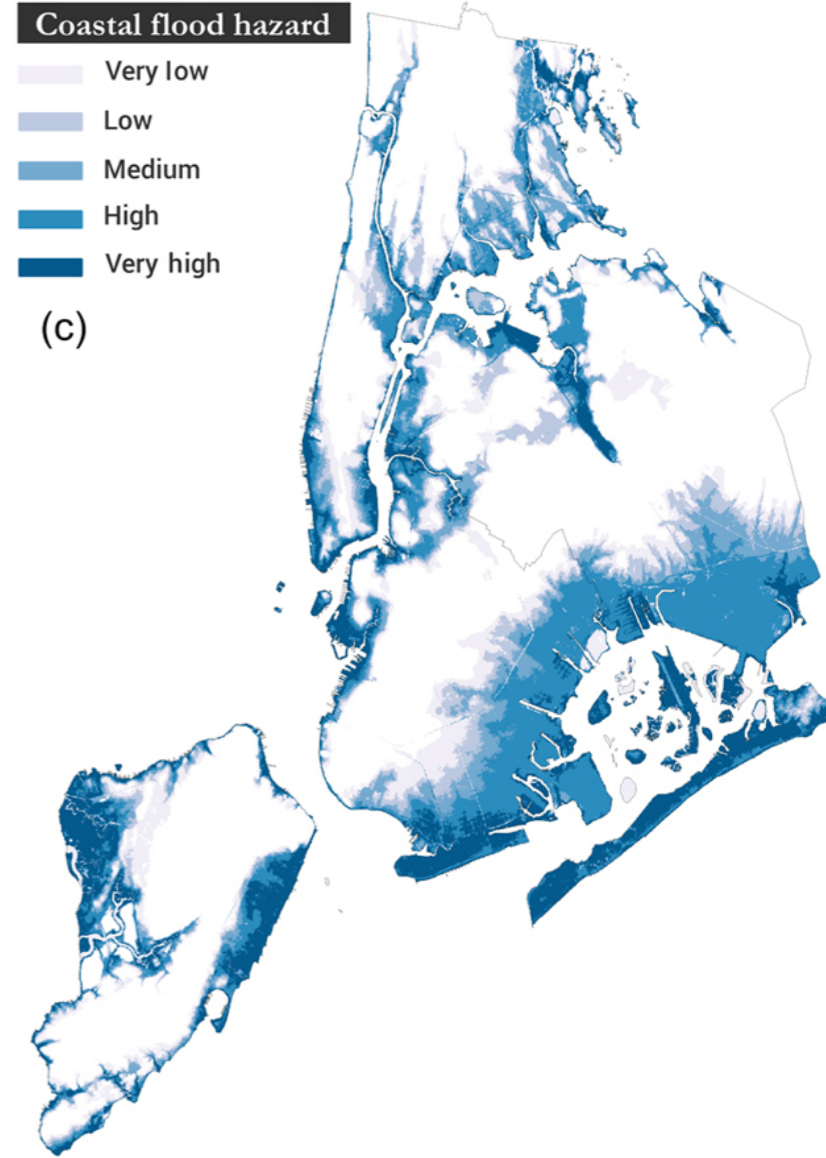


Coastal Flooding

Coastal flood hazard

- Very low
- Low
- Medium
- High
- Very high

(c)



THANKS TO

- ▶ Chris Kennedy, Luis Ortiz, Ahmed Mustafa, Claudia Tomateo, Rositsa Ilieva, Veronica Olivotto, Zbigniew Grabowski, Pablo Herreros-Cantis
- ▶ US National Science Foundation, Kresge Foundation, City of New York

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THANK YOU

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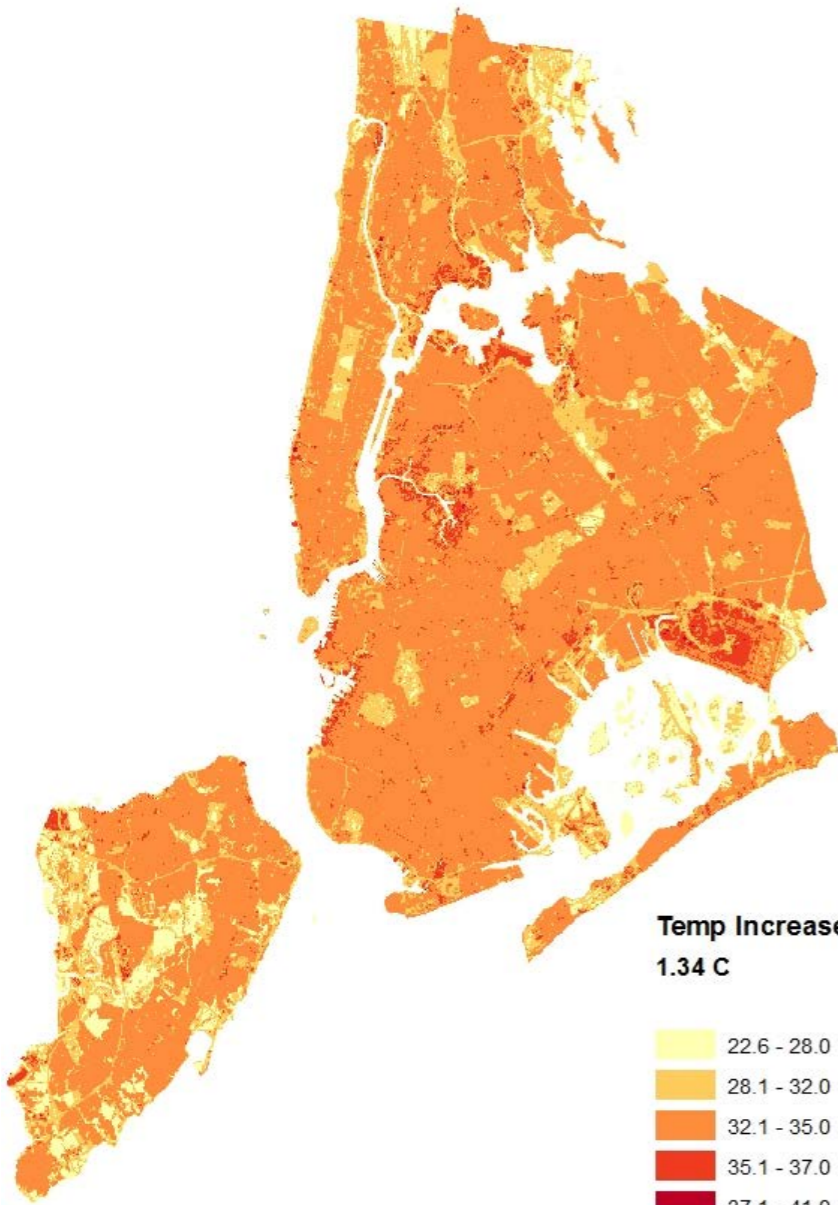
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New York City Temperature Projections

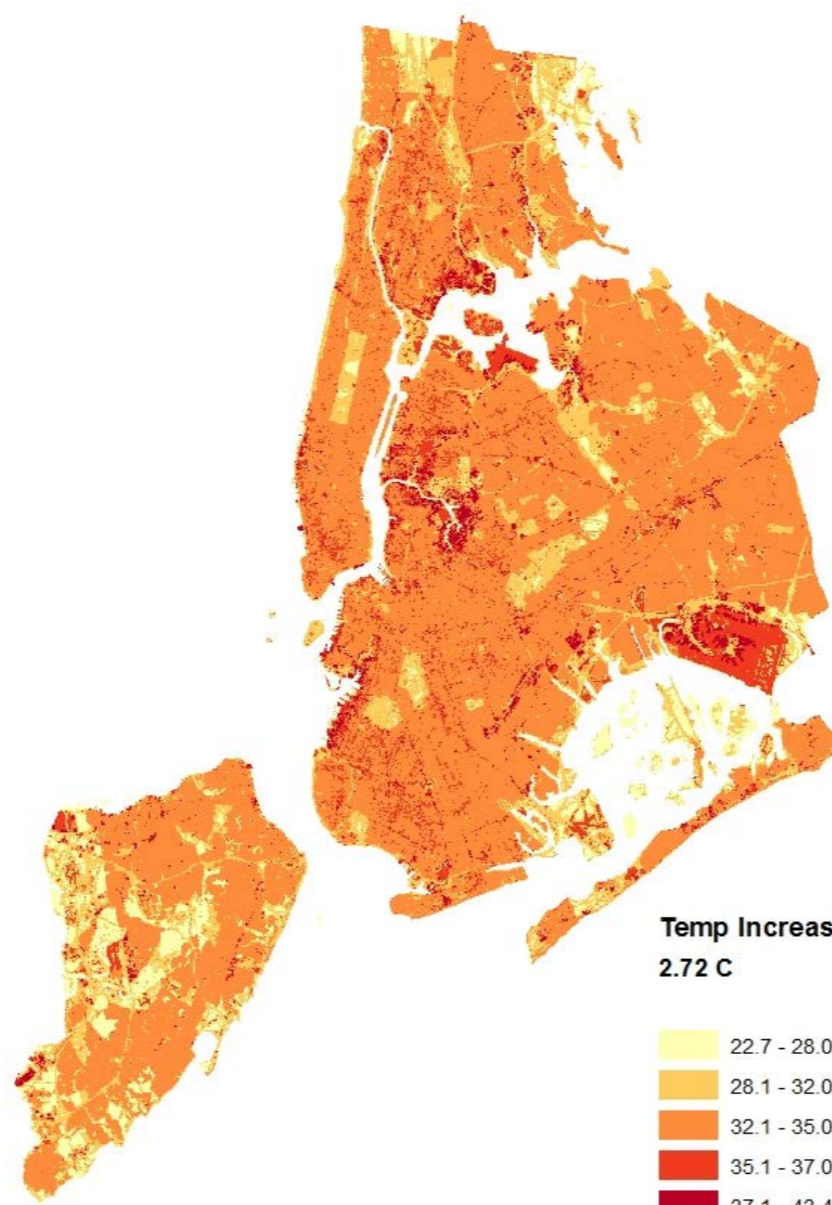
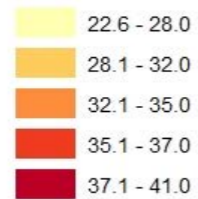
2020s

2050s

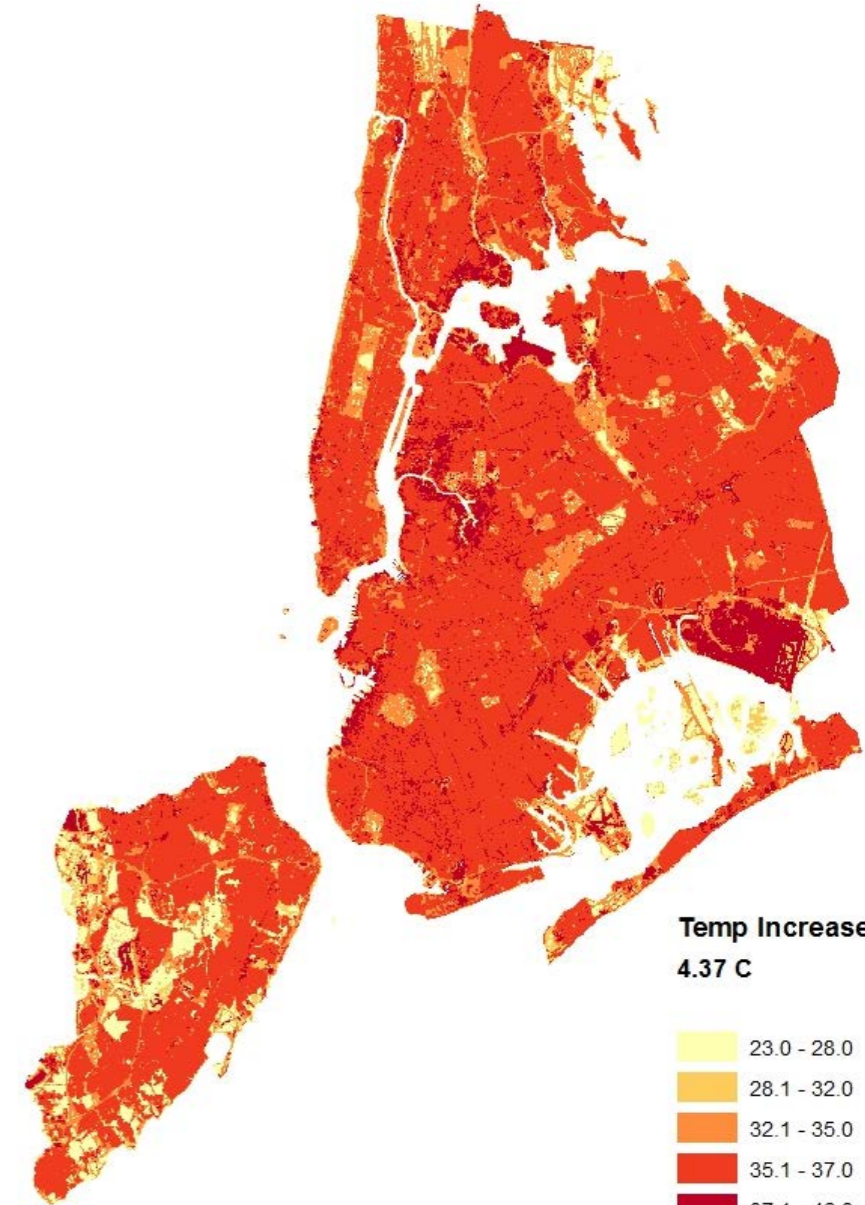
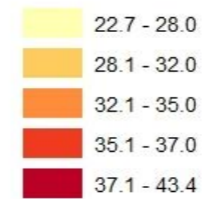
2080s



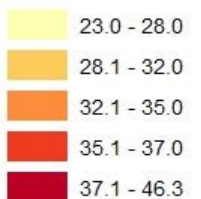
Temp Increase
1.34 C



Temp Increase
2.72 C



Temp Increase
4.37 C



INDOOR EXTREME HEAT EXPOSURE

