Healthy Places Index and California's Health Equity Metric for COVID-19

California Chronic Disease Prevention Leadership Team

Jan 28, 2021

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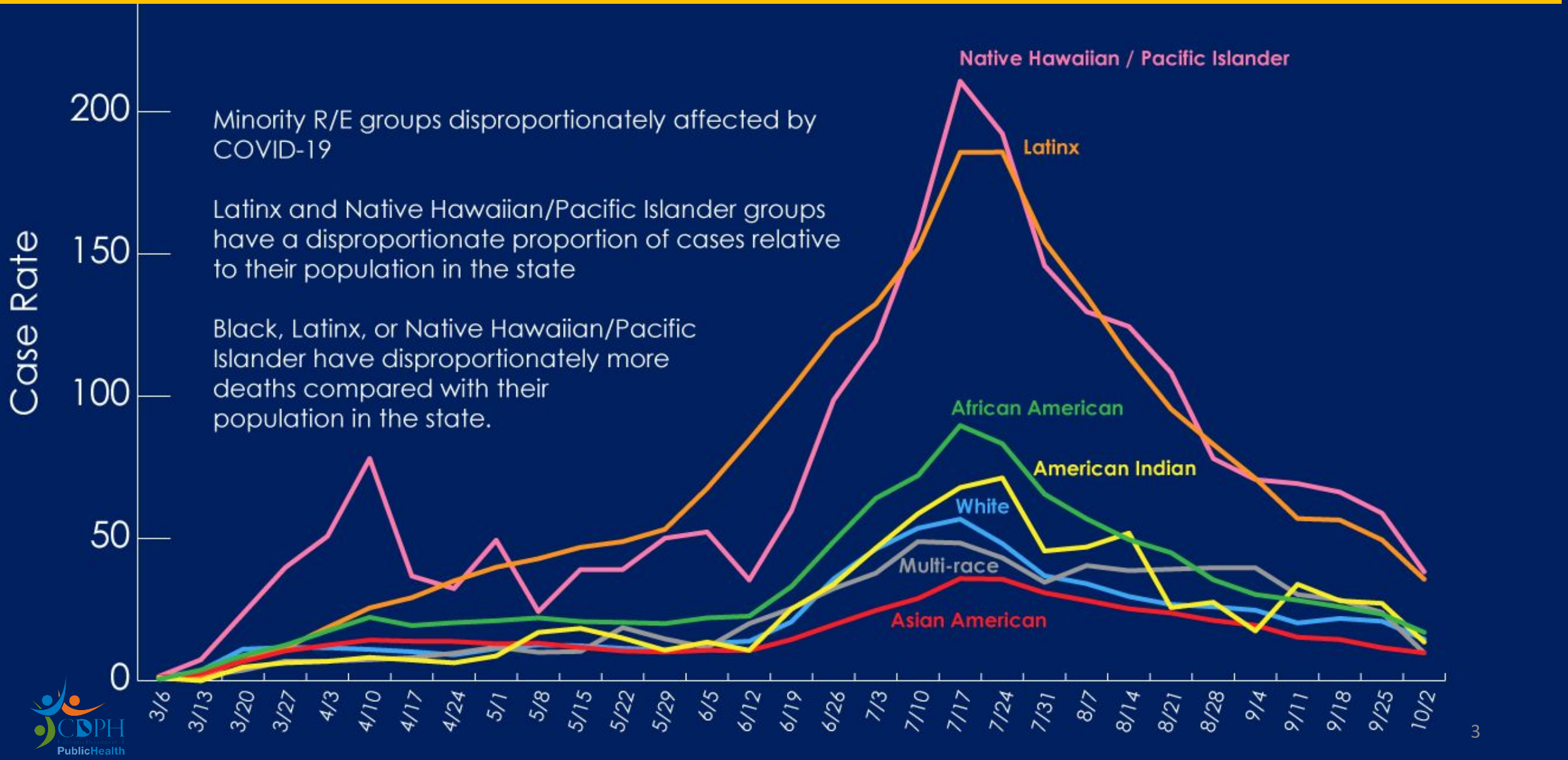
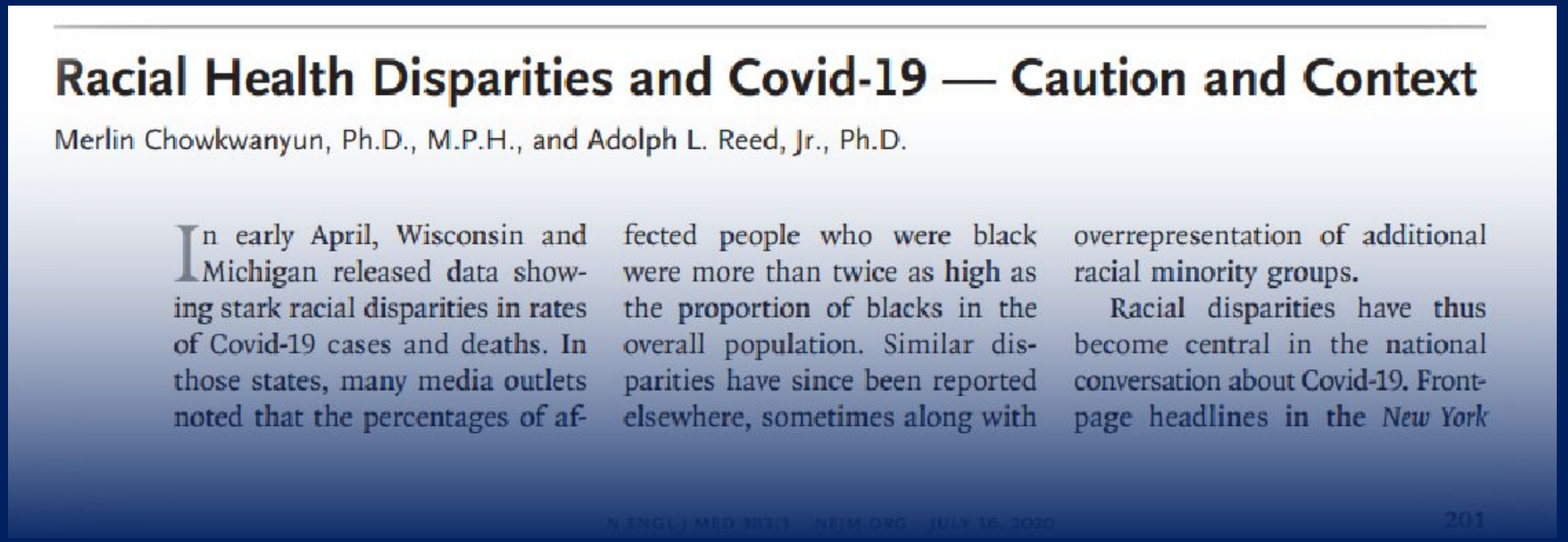
Questions to keep in mind

- Why should we use HPI over some other Index that is available?
- Is the data outdated?
  Is the census tract the right geography?
  Is HPI missing in a lot of locations?
- What if the index does not include race?
- Should the Index be designed based on the particular outcome we are trying to address?
- What are local health departments supposed to do about this?

Disparities in COVID-19 in CA | Race/ethnicity



Disparities in COVID-19 in CA | The Challenge



Racial Health Disparities and Covid-19 — Caution and Context

Merlin Chowkwanyun, Ph.D., M.P.H., and Adolph L. Reed, Jr., Ph.D.

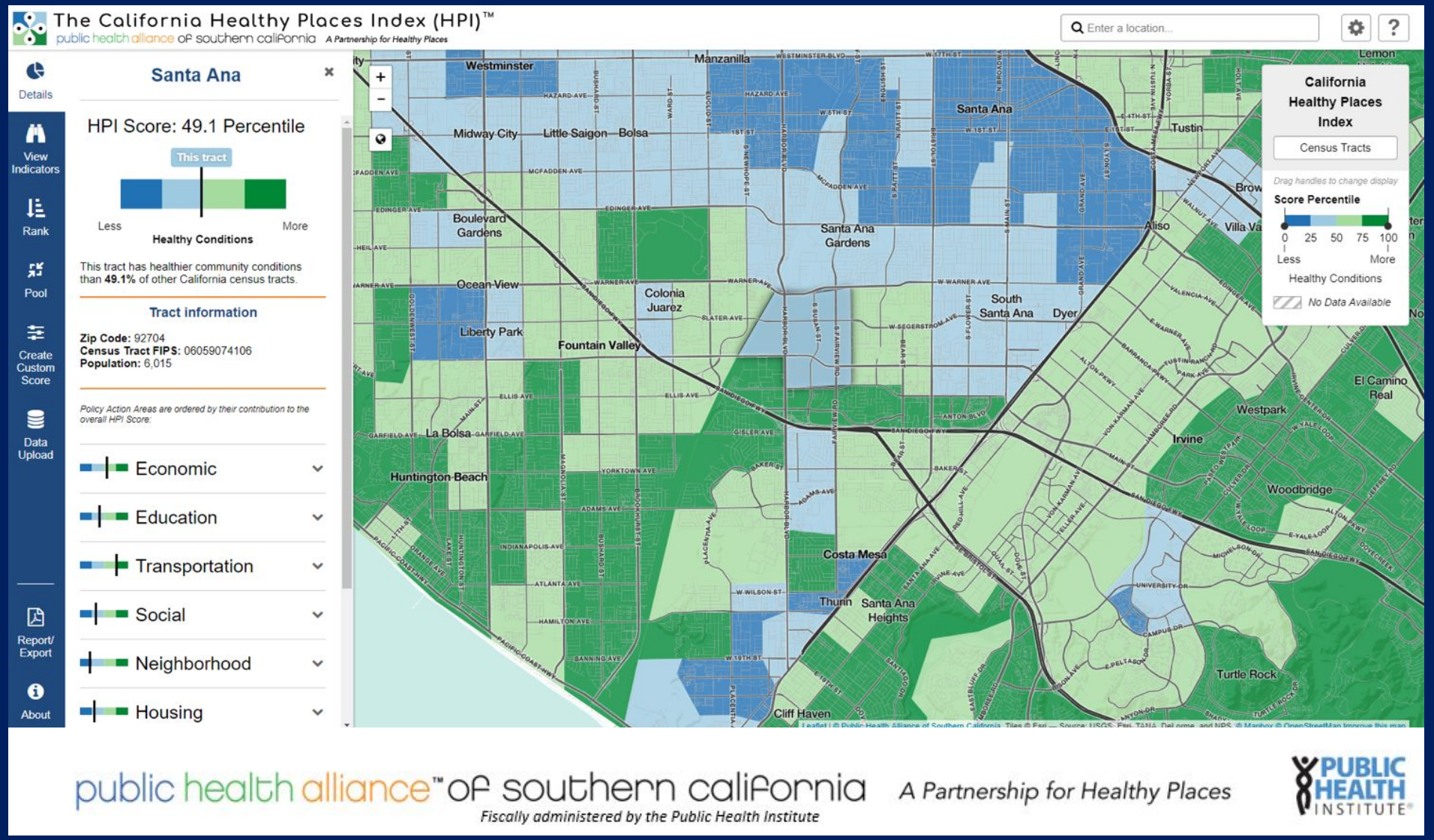
In early April, Wisconsin and Michigan released data showing stark racial disparities in rates of Covid-19 cases and deaths. In those states, many media outlets noted that the percentages of affected people who were black were more than twice as high as the proportion of blacks in the overall population. Similar disparities have since been reported elsewhere, sometimes along with overrepresentation of additional racial minority groups.

Racial disparities have thus become central in the national conversation about Covid-19. Front-page headlines in the *New York*

N ENGL J MED 383;3 NEJM.ORG JULY 16, 2020 201

Chowkwanyun and Reed, NEJM 2020; 383:201-203

Healthy Places Index | Introduction



https://healthyplacesindex.org/

Healthy Places Index | Unique Approach

Granular

Fine geographic resolution reveals the variation *within* cities, counties, and communities

Validated

Each indicator – and the overall index – is linked to a summary health outcome: **life expectancy at birth**

Policy Solutions

Each indicator is supported by a wealth of policy solutions detailed in our Policy Guides

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Healthy Places Index | Methods

Indicator Selection

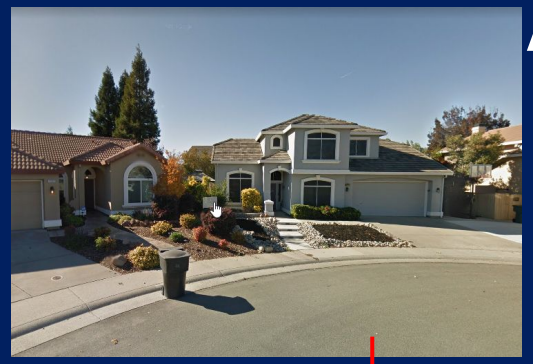
- Informed by literature
- Statewide data publicly available at the census tract
- Actionable for policy, systems, and environmental change
- Optimize association with life expectancy

Healthy Places Index | Methods

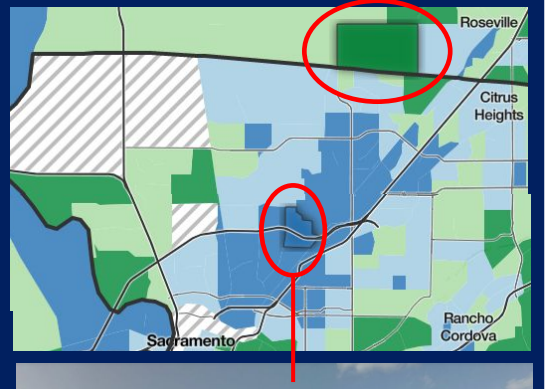
- Indicator scores are standardized (Z score)
- Policy Action Area score (mean of indicators)
- Policy Action Area weights (predictive of life expectancy)

- Final HPI calculated by:
  - Multiplying each policy action area score with its weight
  - Summing across eight policy action areas

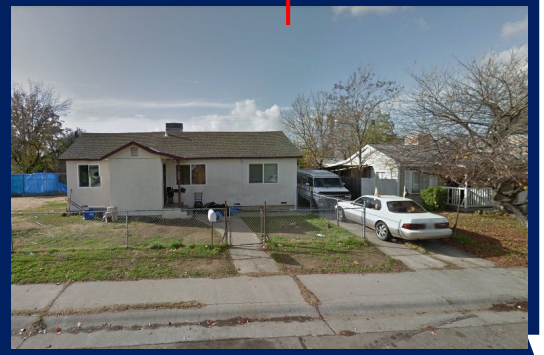
Most Healthy Conditions(1.53)
100th percentile



Roseville
(0.56)
83rd percentile



State Mean
(0)
50th percentile



Del Paso Heights
(-0.73)
9th percentile

Least Healthy Conditions (-1.99)
0th Percentile

Healthy Places Index | Indicators

Economic 32%	Education 19%	Transportation 16%	Social 10%	Neighborhood 8%	Housing 5%	Clean Environment 5%	Healthcare Access 5%
•Employed •Income •Above Poverty	• In Pre- School • In High School • Bachelor's Education or Higher	• Automobile Access • Active Commuting	• Two Parent Household • Voting in 2012	• Retail Density • Park Access • Tree Canopy • Supermarket Access • Alcohol Outlets	• Low-Income Renter Severe Housing Cost Burden • Low-Income Homeowner Severe Housing Cost Burden • Housing Habitability • Uncrowded Housing • Homeownership	• Ozone • PM 2.5 • Diesel PM • Water Contaminants	• Insured Adults

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The Public Health Disparities Geocoding Project Monograph

The Public Health Disparities Geocoding Project

Welcome to the Public Health Disparities Geocoding Project Monograph

These pages present an introduction to geocoding and using area-based socioeconomic measures with public health surveillance data, based on the work of the Public Health Disparities Geocoding Project at the Harvard T. H Chan School of Public Health, Department of Social and Behavioral Sciences.

· The Executive Summary describes the motivation behind the Public Health Disparities Geocoding Project, and summarizes the methodology, key findings, and recommendations.

· The Introduction provides a more in-depth look at the history of geocoding and area-based measures, the objectives of our project, and our main findings. We include a glimpse of what routine public health surveillance of socioeconomic disparities in health could look like if conducted over a variety of health outcomes over the lifecourse, from birth to death, using a single area-based socioeconomic measure at the census tract level.

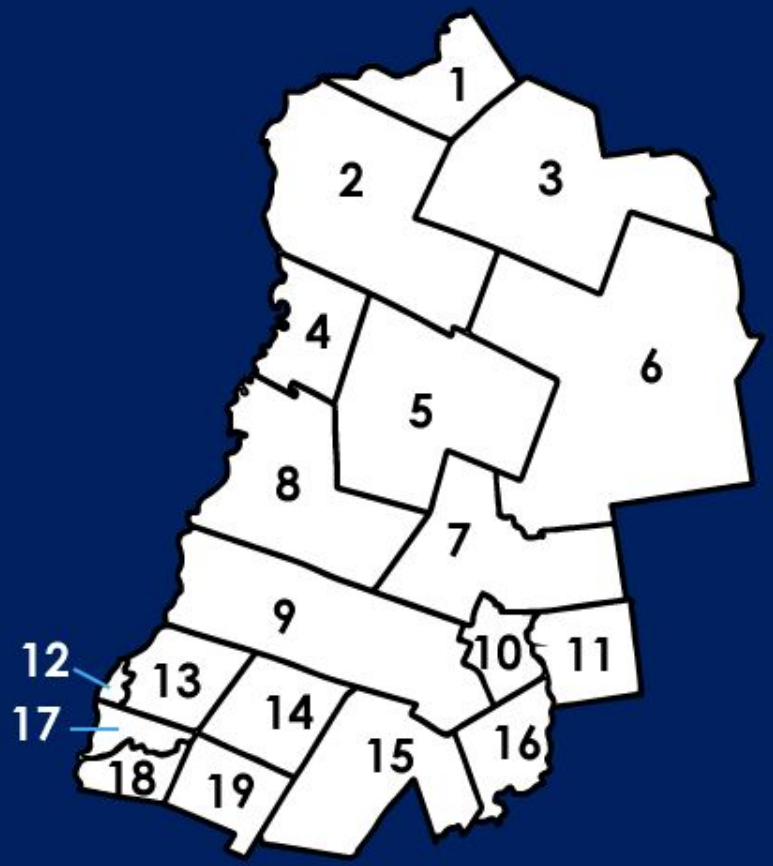
· The Publications page is a comprehensive list of the publications of the Public Health Disparities Geocoding Project, and includes pdf copies of all of our published work.

· We also provide a primer on the basics of Geocoding, including descriptions of the many options and services available, and the nitty-gritty details of address cleaning, address formatting, and evaluation of geocoding accuracy.

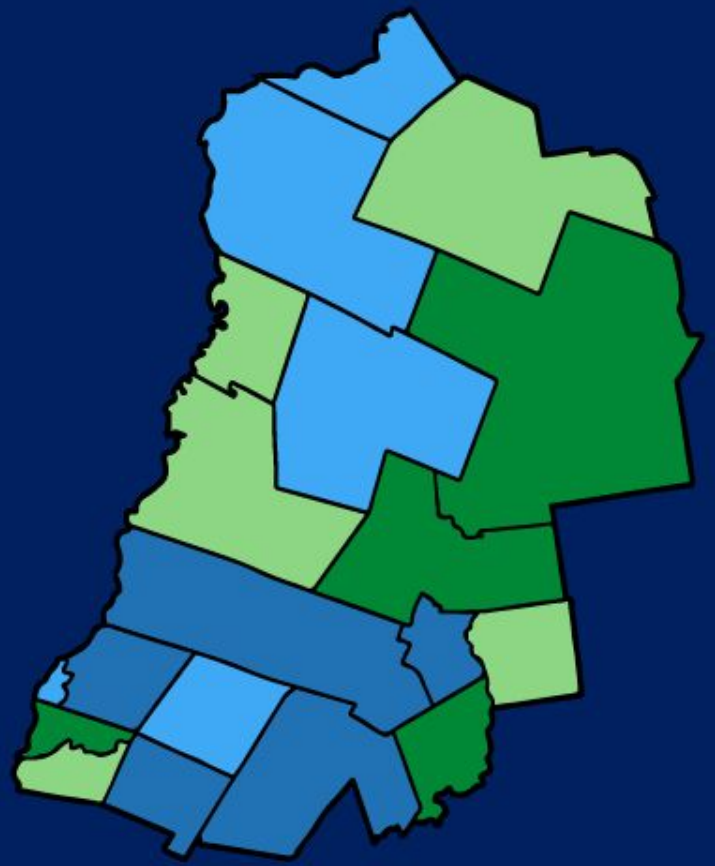
· In Generating ABSMs we describe the concepts, methods, and measures behind creating area-based socioeconomic measures, including a summary

https://www.hsph.harvard.edu/thegeocodingproject/

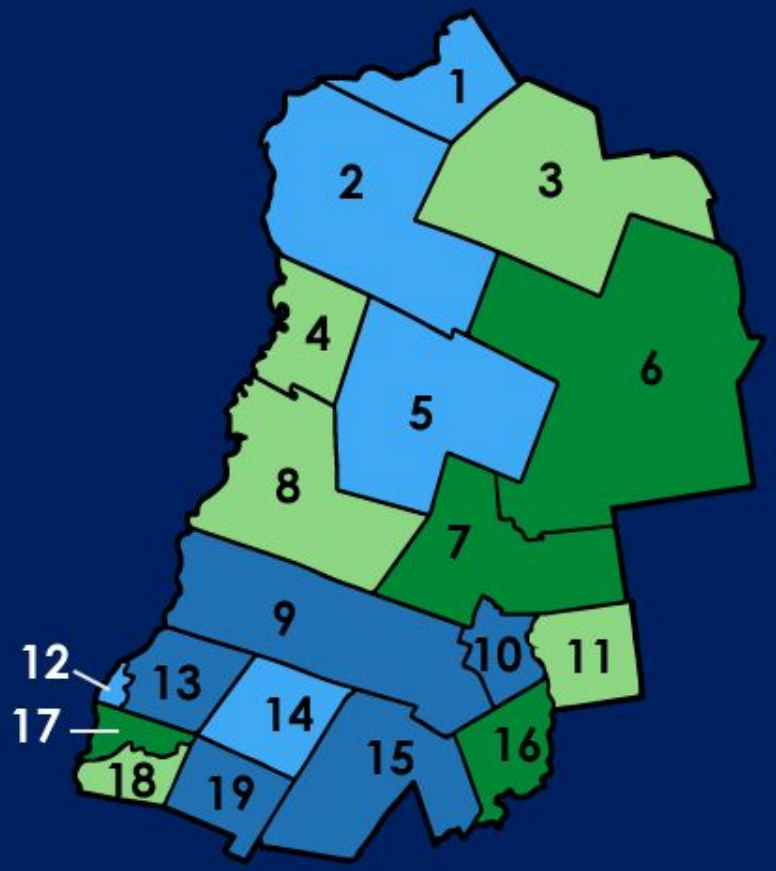
The Health Equity Metric | Methods



Tract	HPI Score	Rank	Tract	
1	-1.41	7	10	Quartile 1
2	-1.05	9	15	
3	0.55	15	9	
4	0.03	14	19	
5	-0.71	10	13	
6	0.81	18	14	Quartile 2
7	0.66	16	1	
8	-0.56	11	12	
9	-1.87	3	2	
10	-1.94	1	5	
11	-0.08	12	8	Quartile 3
12	-1.4	8	11	
13	-1.54	5	18	
14	-1.52	6	4	
15	-1.92	2	3	
16	0.80	17	7	Quartile 4
17	1.10	19	16	
18	-0.06	13	6	
19	-1.57	4	17	



The Health Equity Metric | Methods



	Tract	Tests	Positives	Positivity
Quartile 1	10	1395	82	6%
	15	1342	71	5%
	9	103	14	14%
	19	1863	90	5%
	13	1270	84	7%
Quartile 2	14	1022	43	4%
	1	1827	50	3%
	12	1943	94	5%
	2	1712	63	4%
	5	1030	71	7%
Quartile 3	8	1627	79	5%
	11	1835	87	5%
	18	1862	61	3%
	4	1132	76	7%
	3	1774	81	5%
Quartile 4	7	1299	84	6%
	16	1613	91	6%
	6	1869	75	4%
	17	1133	87	8%

Health Equity Metric
Bottom Quartile Test Positivity

average tract positivity

$$\frac{6 + 5 + 14 + 5 + 7}{5} = 7.4$$

test over test for the quartile

$$100 \times \frac{82 + 71 + 14 + 90 + 84}{(1395 + 1342 + 103 + 1863 + 1270)} = 5.7$$

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The Health Equity Metric | Methods

Use HPI scores to assign county's tracts to quartiles → **Sum positive tests and total tests for the bottom quartile** → **Divide total positive tests by total tests and multiply by 100**

A county's census tracts are assigned to intra-county HPI quartiles based on score. The quartile that appears on the HPI website may differ from a tract's quartile once assessed within the county.

Test positivity over a 7-day period (based on specimen collected date) with 7-day lag for the tracts in the lowest HPI quartile in a given county, excluding tests associated with prison, ICE, or Department of State Hospitals facilities.

This is not calculated for small counties (defined as those with a population less than ~100,000 residents, including Sutter County with approximately 105,000 residents).

CalREDIE & LA County (Electronic Lab Reporting - ELR)

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Blueprint for a Safer Economy

County risk level	Adjusted case rate* 7-day average of daily COVID-19 cases per 100K with 7-day lag, adjusted for number of tests performed	Positivity rate** 7-day average of all COVID-19 tests performed that are positive	
		Entire county	Healthy equity quartile
WIDESPREAD Many non-essential indoor business operations are closed	More than 7.0 Daily new cases (per 100k)	More than 8.0% Positive tests	
SUBSTANTIAL Some non-essential indoor business operations are closed	4.0 – 7.0 Daily new cases (per 100k)	5.0 – 8.0% Positive tests	5.3 – 8.0% Positive tests
MODERATE Some indoor business operations are open with modifications	1.0 – 3.9 Daily new cases (per 100k)	2.0 – 4.9% Positive tests	2.2 – 5.2% Positive tests
MINIMAL Most indoor business operations are open with modifications	Less than 1.0 Daily new cases (per 100k)	Less than 2.0% Positive tests	Less than 2.2% Positive tests

*Small counties (those with a population less than 106,000) may be subject to alternate case assessment measures for purposes of tier assignment.
**Health equity metric is not applied for small counties. The health equity metric is used to move to a less restrictive tier.

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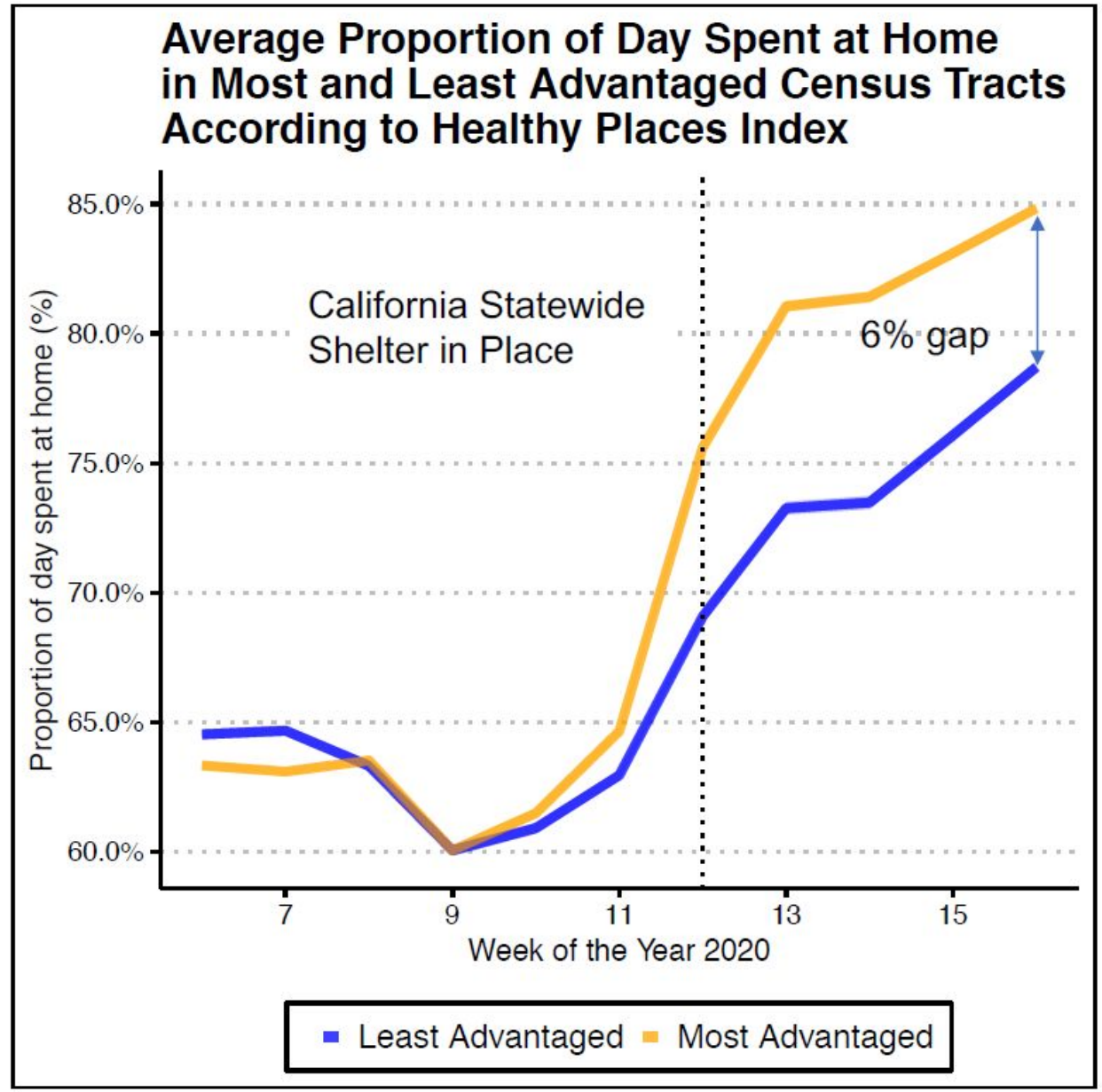
Statewide Mobility by Health Equity Measures

(Data freshness: as of Day 04.14.20)

THE TAKEAWAY

The least advantaged Californians struggle to self-isolate

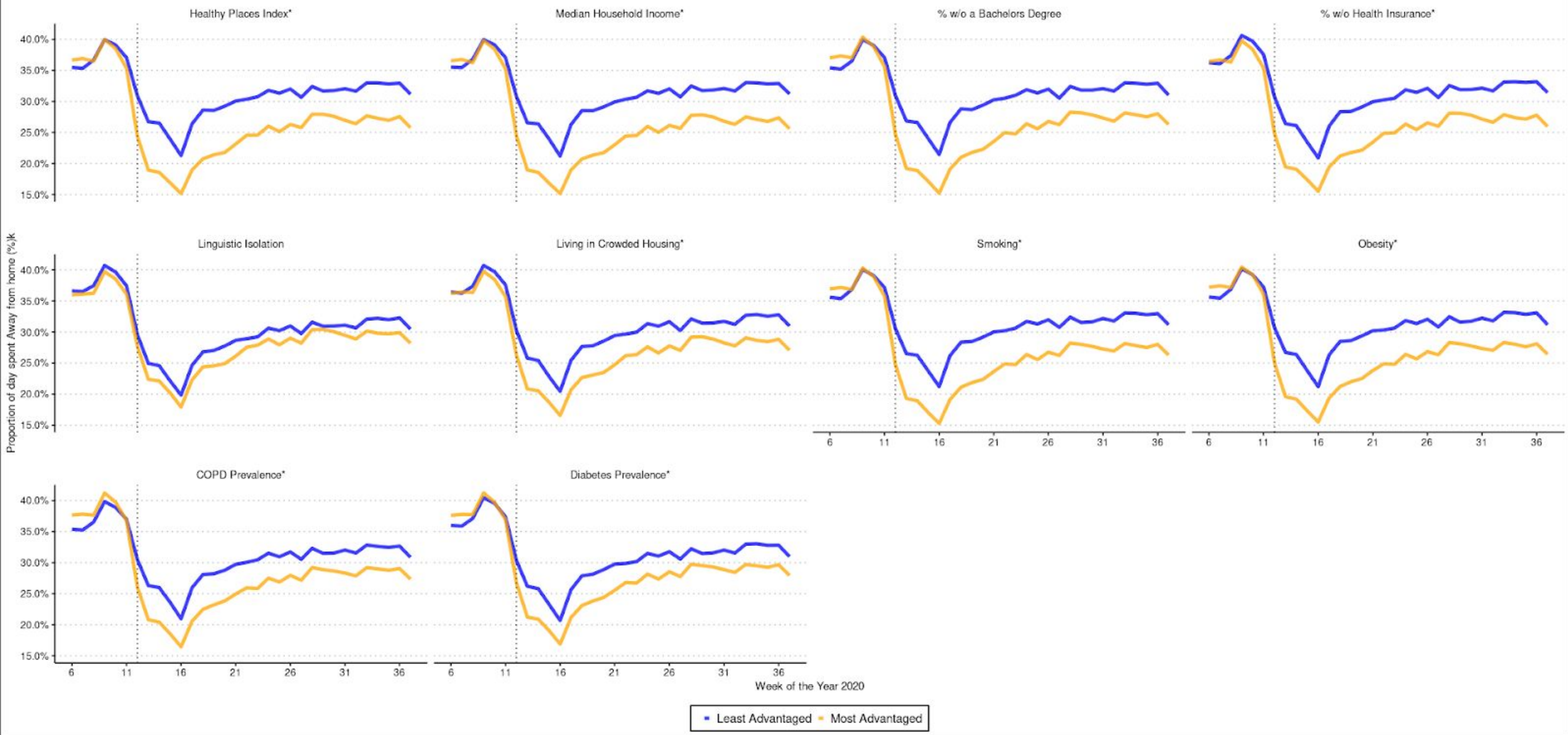
- The most advantaged census tracts spend 6% more of the of the day at home compared to the least advantaged census tracts
- The Healthy Places Index ranks census tracts by how specific community conditions affect health outcomes.
- Community conditions include indicators related to housing, education, environmental, economic, and social factors.
- Physical distancing information from aggregated mobile device location data.



Source: BlueDot Inc.

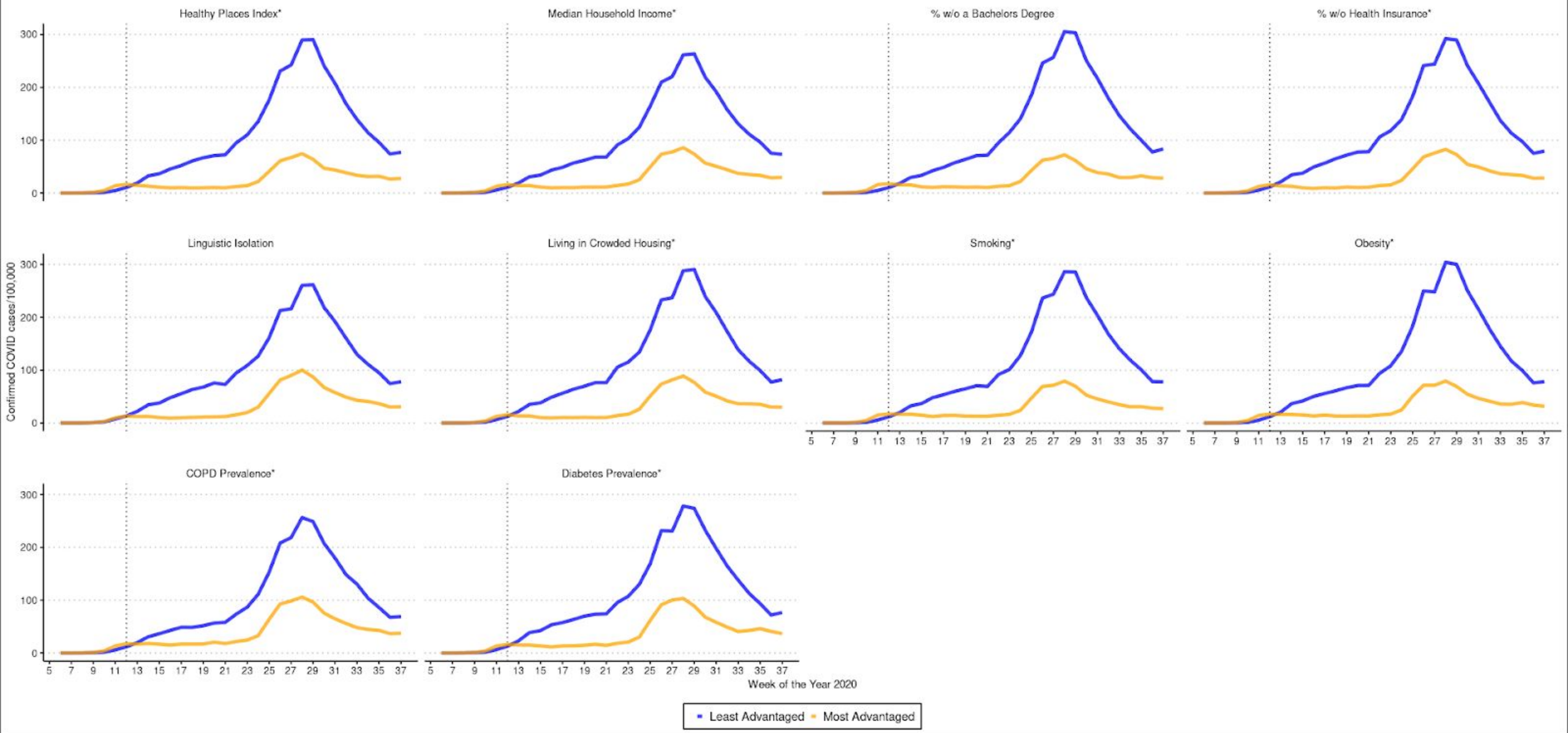
The least advantaged Californians were less able to adhere to the shelter in place order.

Proportion of day spent Away from home for tracts in the most and least advantaged quartiles of each indicator.

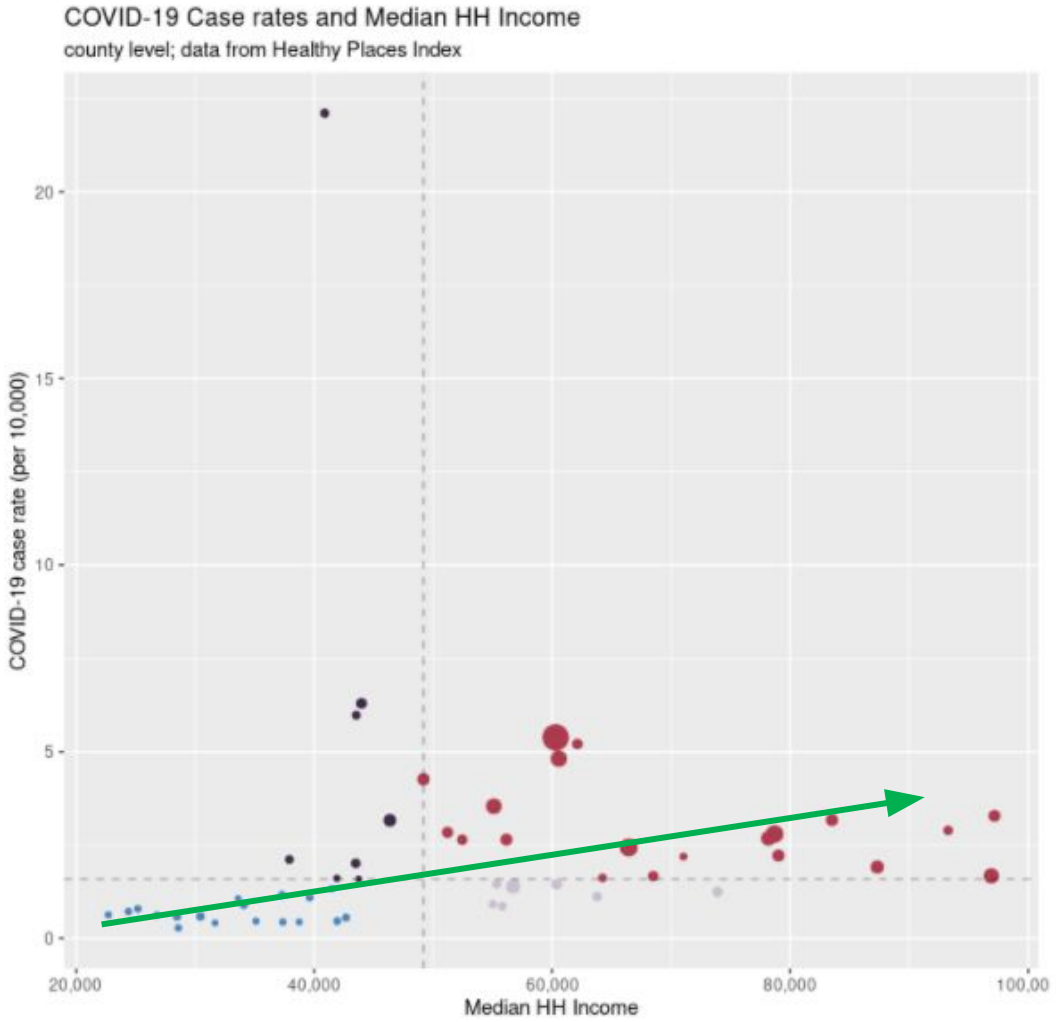


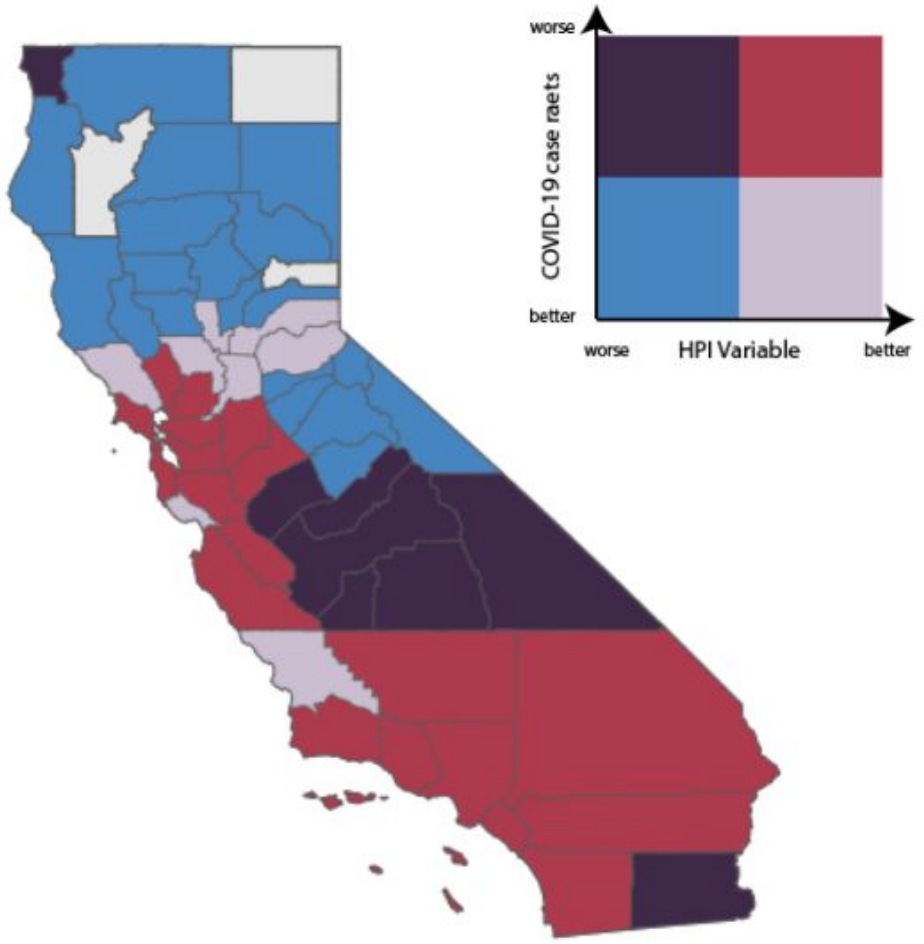
The least advantaged Californians suffered far more cases of COVID-19.

Weekly COVID-19 case rates for tracts in the most and least advantaged quartiles of each indicator.

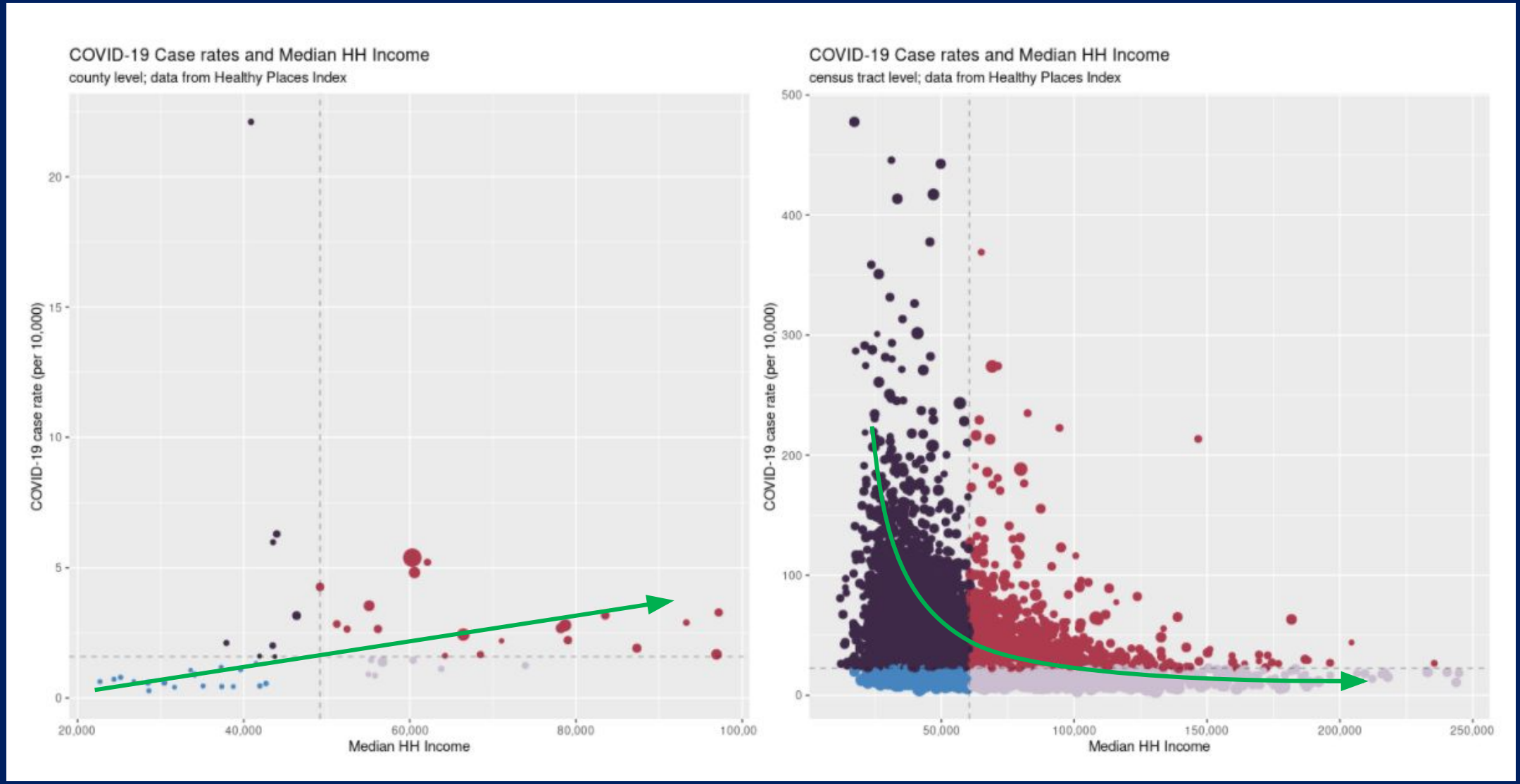


HPI & COVID 19 | Importance of Community-level Data

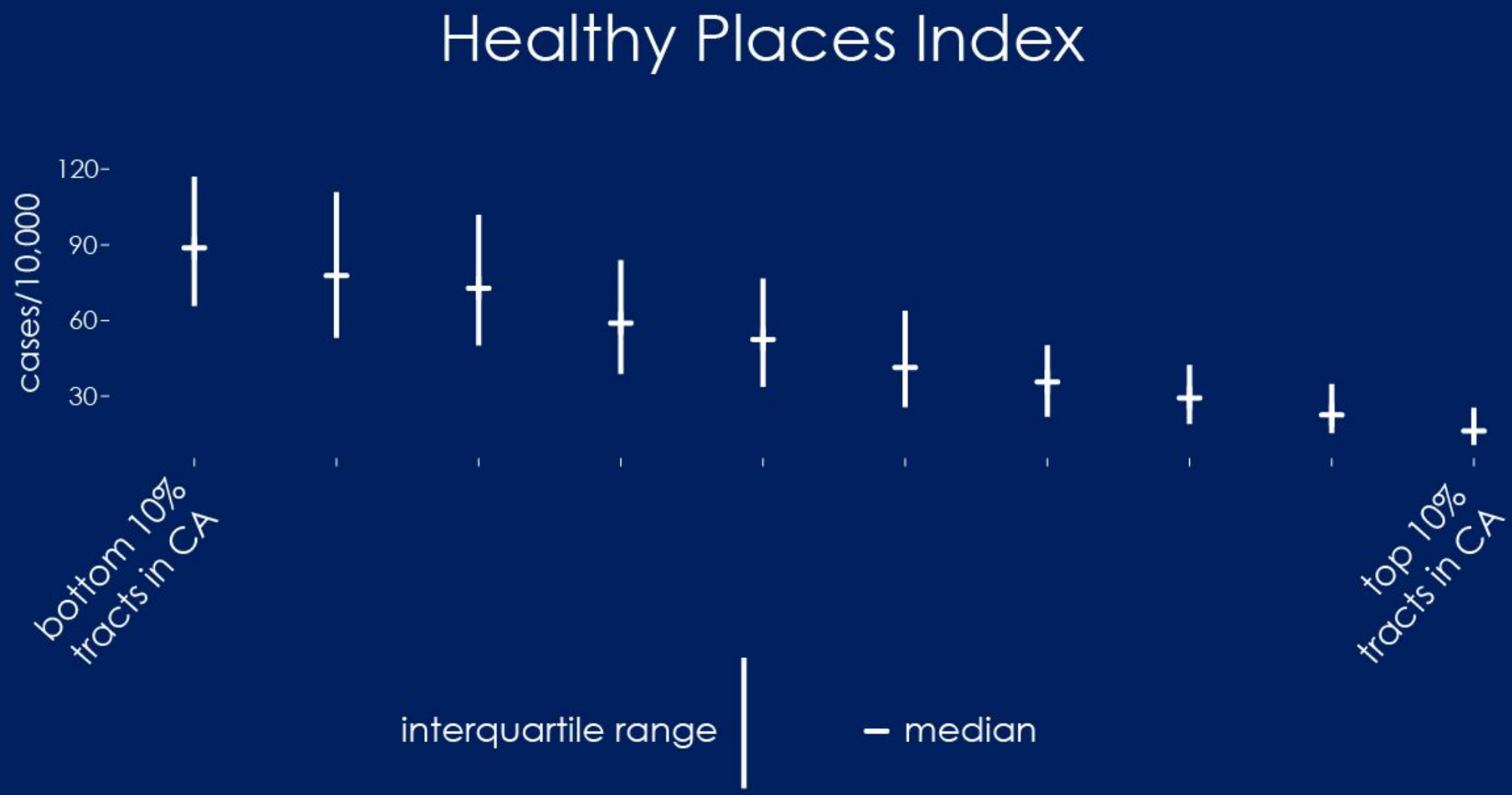


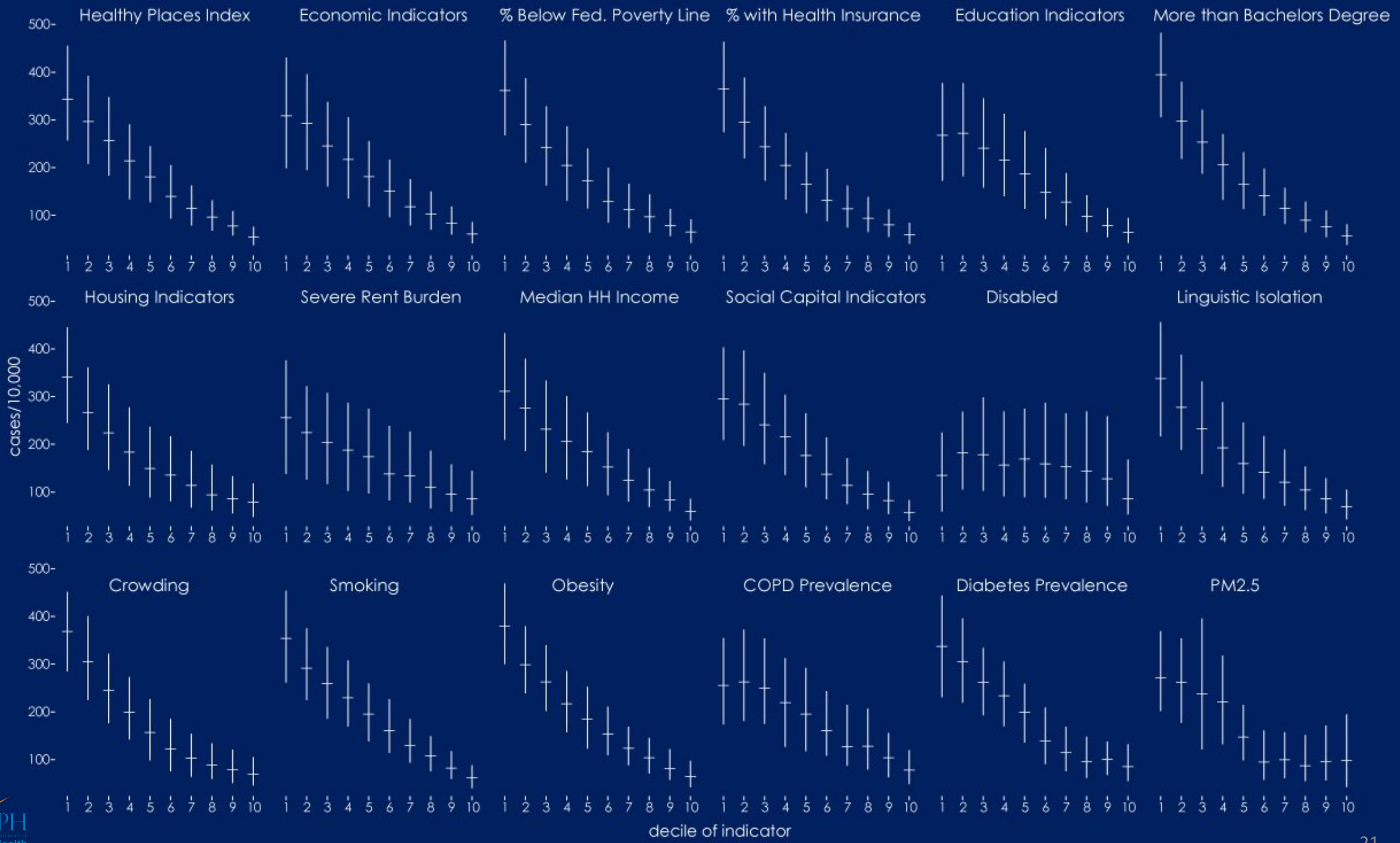


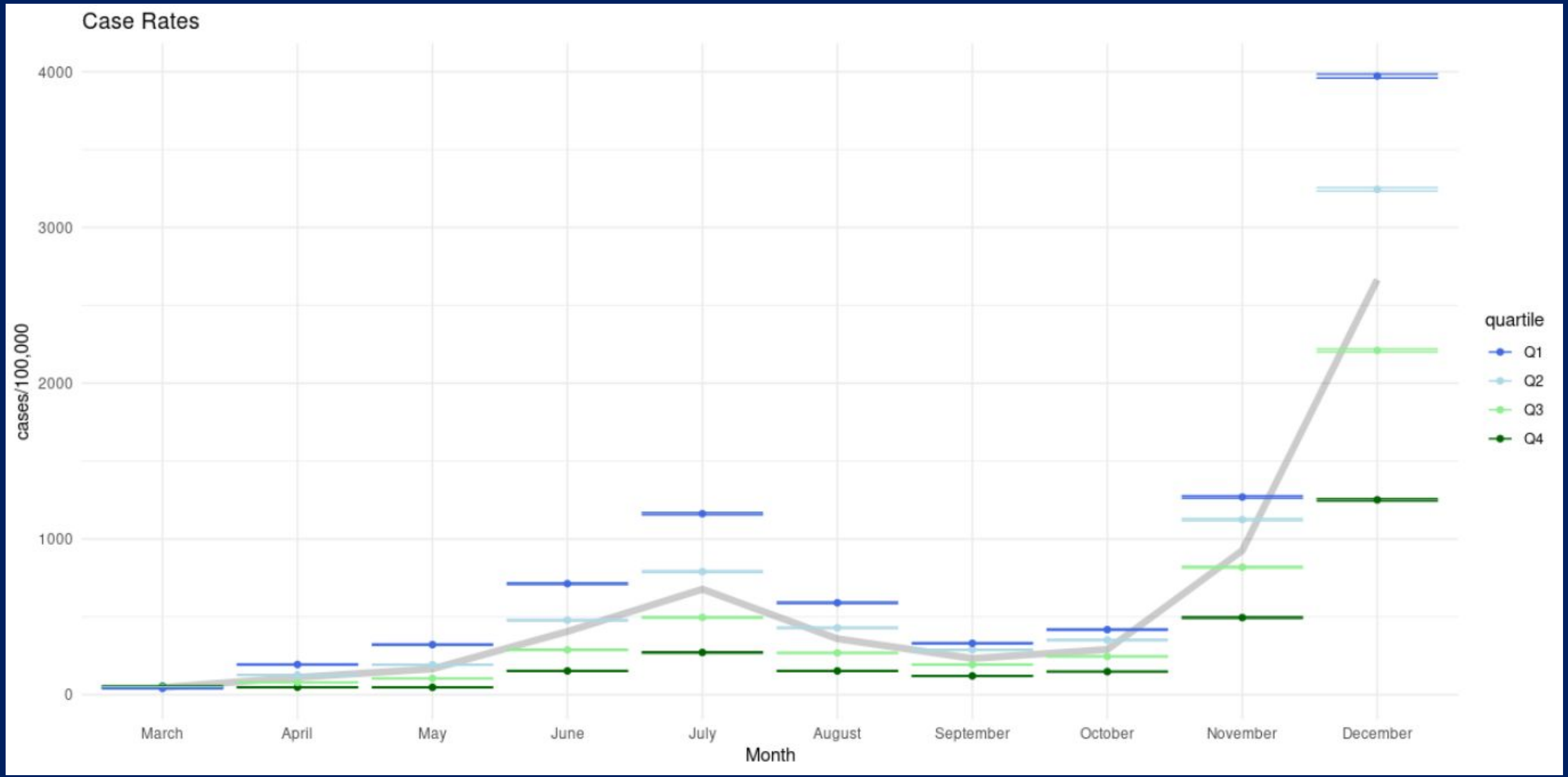
HPI & COVID 19 | Importance of Community-level Data

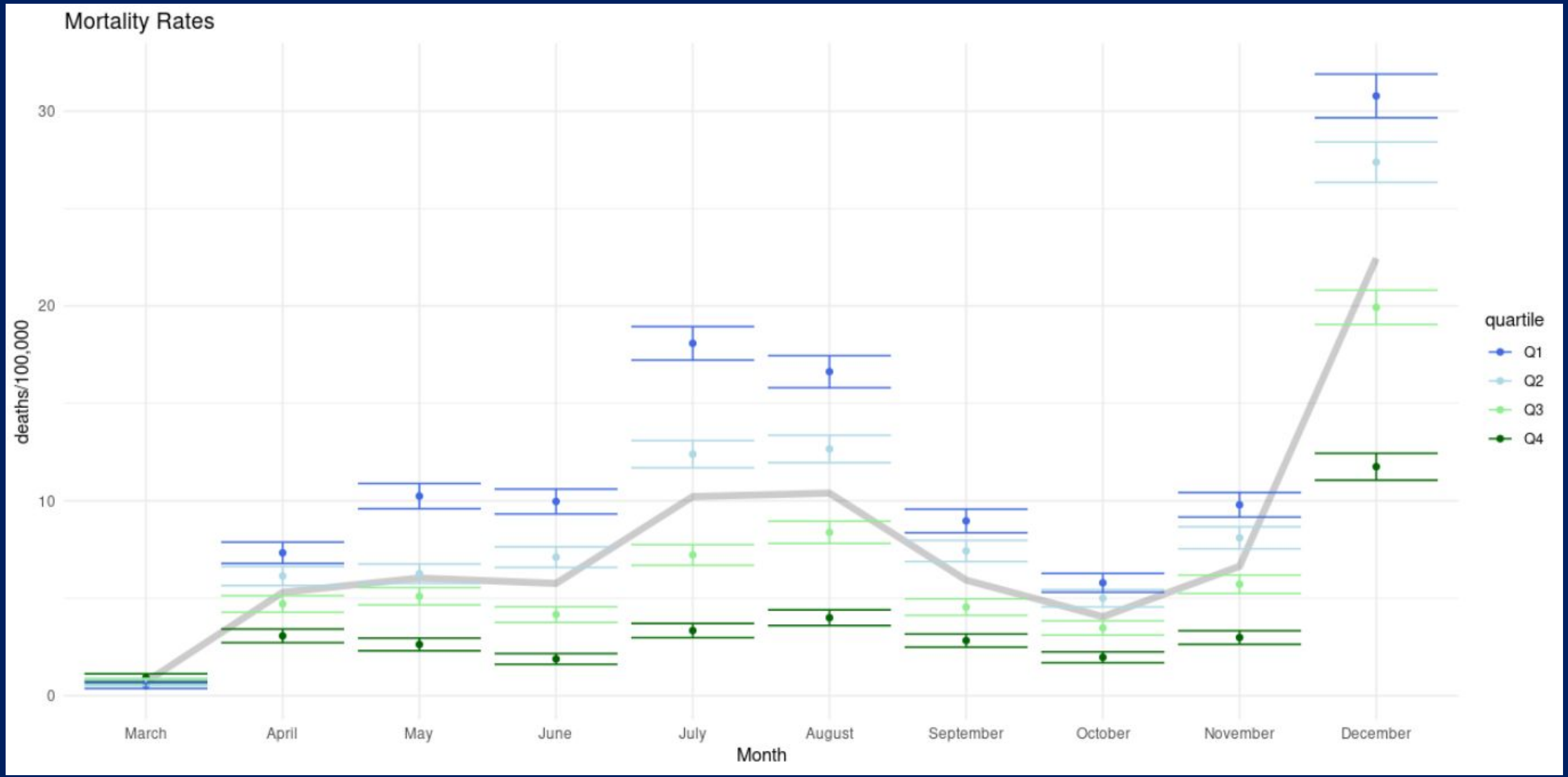


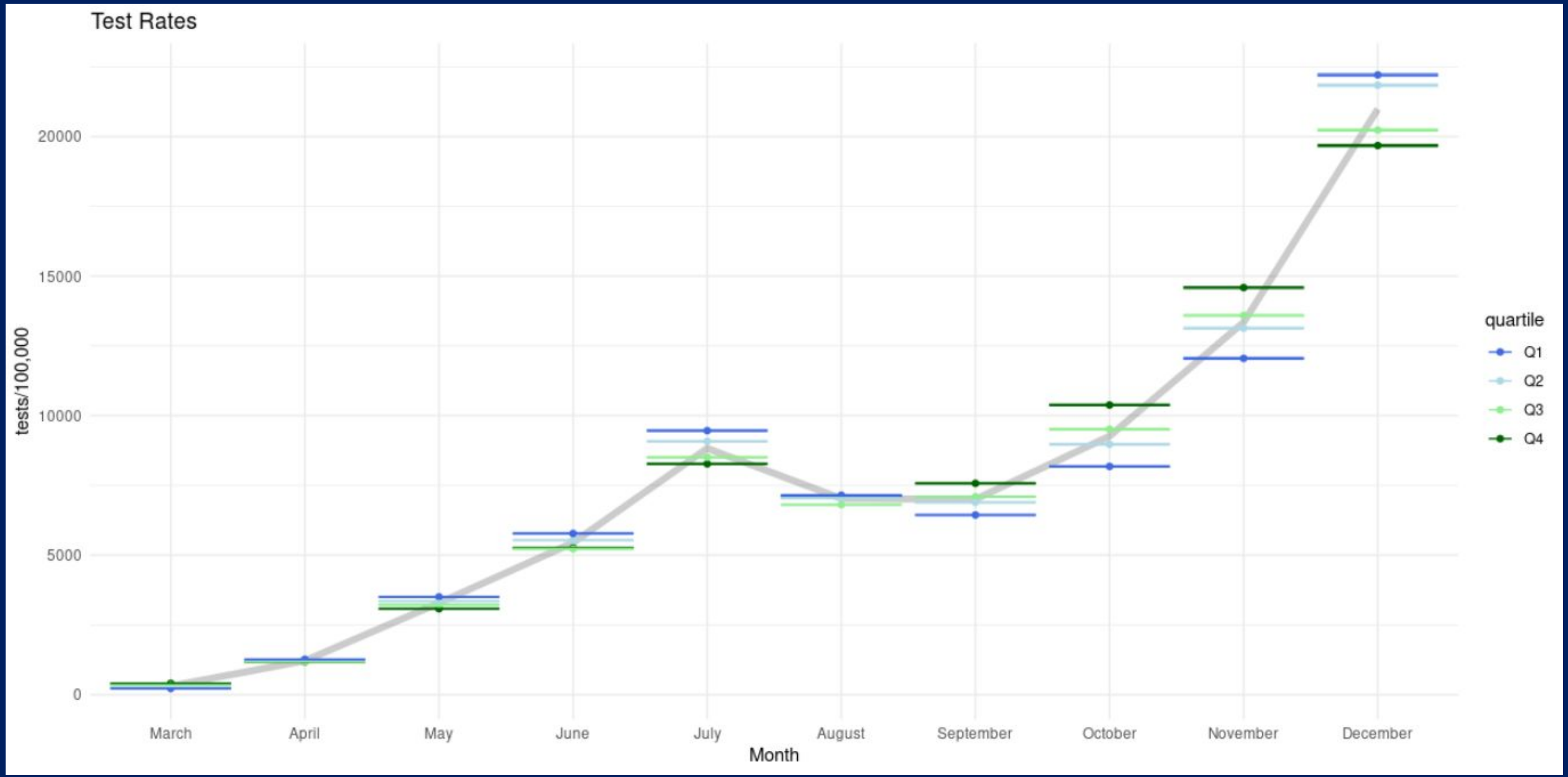
HPI & COVID 19 | Case Rates




Healthy Places Index
Economic Indicators
% Below Fed. Poverty Line
% with Health Insurance
Education Indicators
More than Bachelors Degree
Housing Indicators
Severe Rent Burden
Median HH Income
Social Capital Indicators
Disabled
Linguistic Isolation
Crowding
Smoking
Obesity
COPD Prevalence
Diabetes Prevalence
PM2.5
cases/10,000
500
400
300
200
100
1 2 3 4 5 6 7 8 9 10
decile of indicator

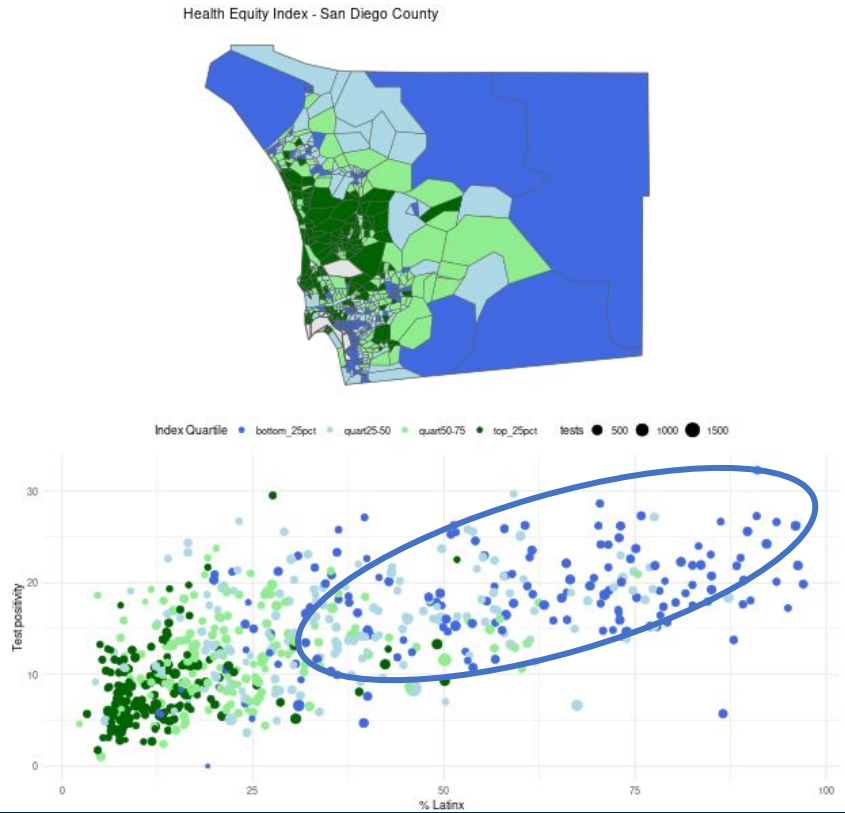

Case Rates
4000
3000
2000
1000
0
cases/100,000
March
April
May
June
July
August
September
October
November
December
Month
quartile
Q1
Q2
Q3
Q4


Mortality Rates
30
20
10
0
deaths/100,000
March
April
May
June
July
August
September
October
November
December
Month
quartile
Q1
Q2
Q3
Q4


Test Rates
20000
15000
10000
5000
0
tests/100,000
March
April
May
June
July
August
September
October
November
December
Month
quartile
Q1
Q2
Q3
Q4

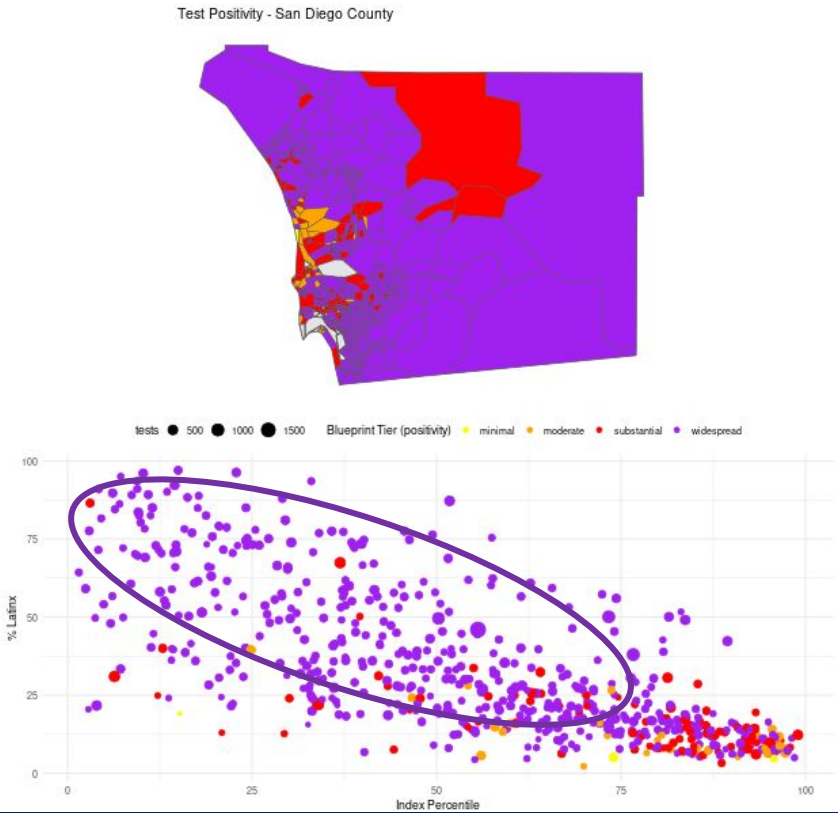
The Health Equity Metric | Race and Ethnicity

Test Positivity vs. % Latinx



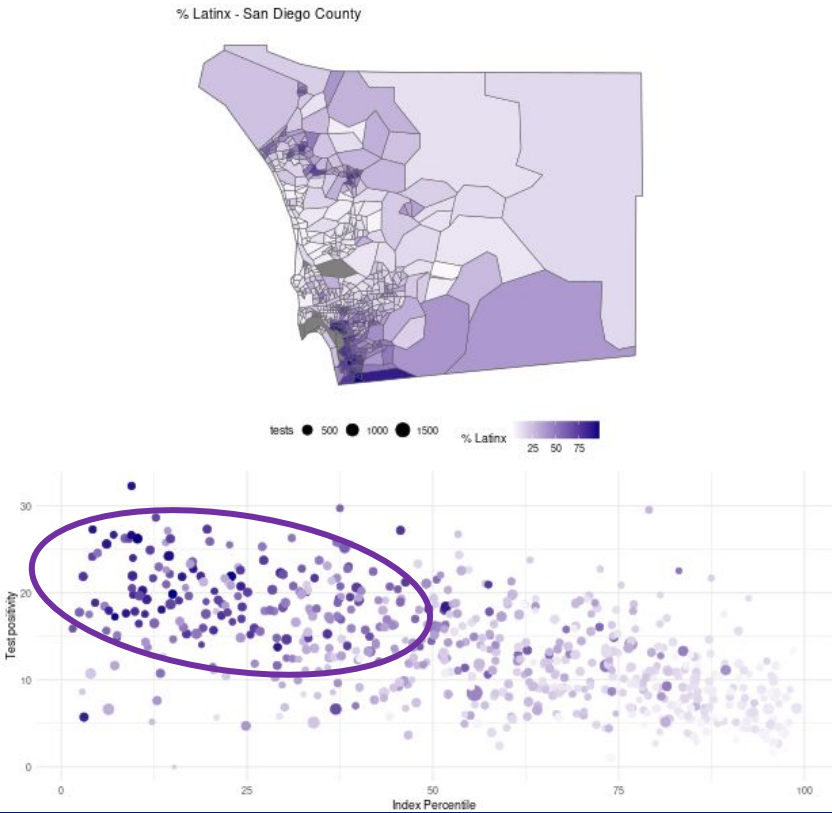
Lowest HPI quartile

HPI vs. % Latinx



Highest positivity

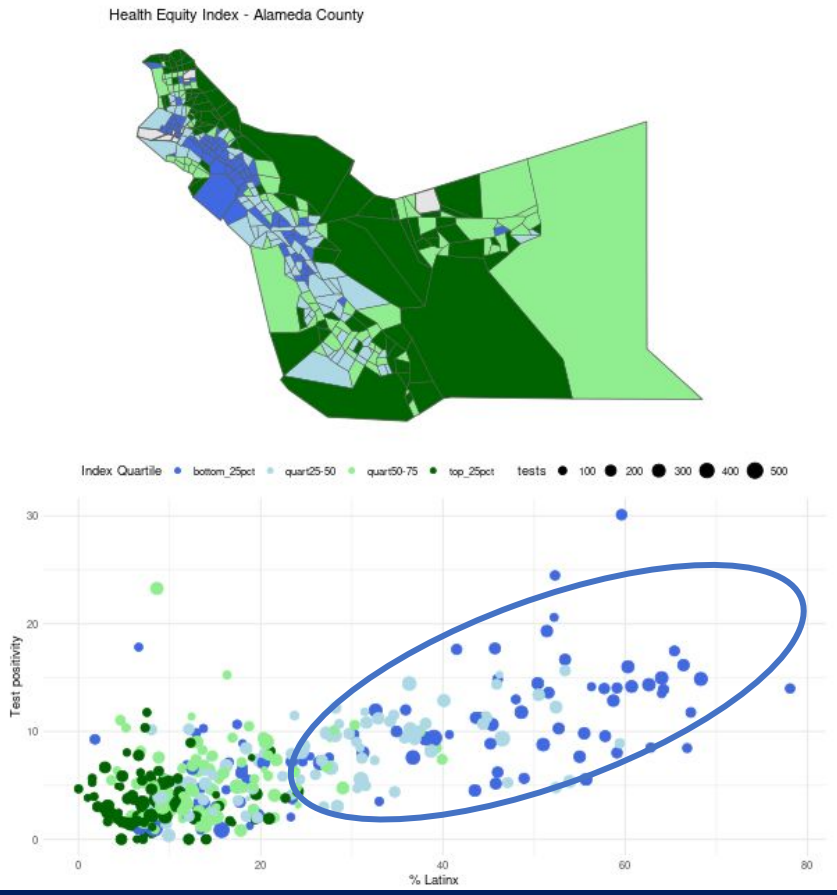
Test Positivity vs. HPI



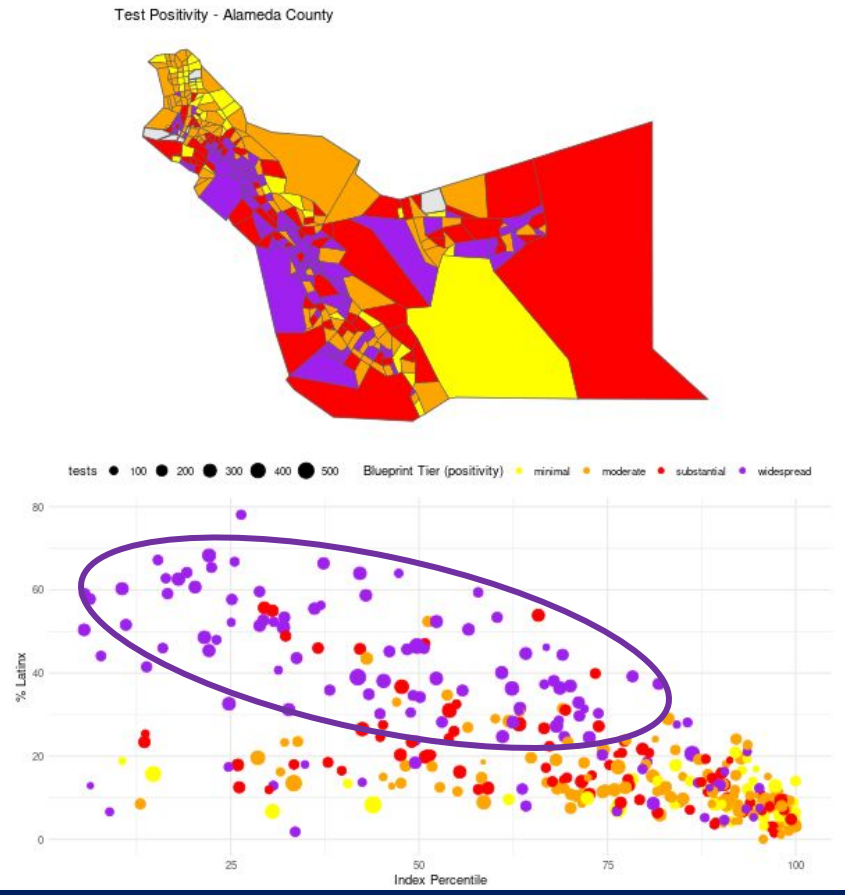
Highest Latinx

The Health Equity Metric | Race and Ethnicity

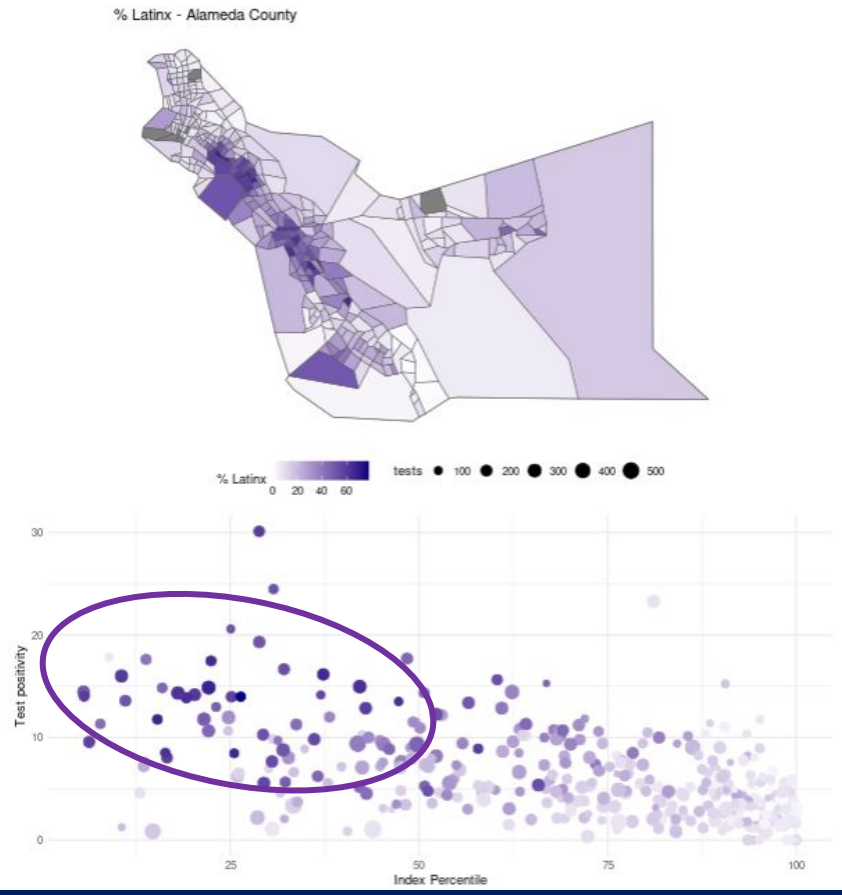
Test Positivity vs. % Latinx



HPI vs. % Latinx



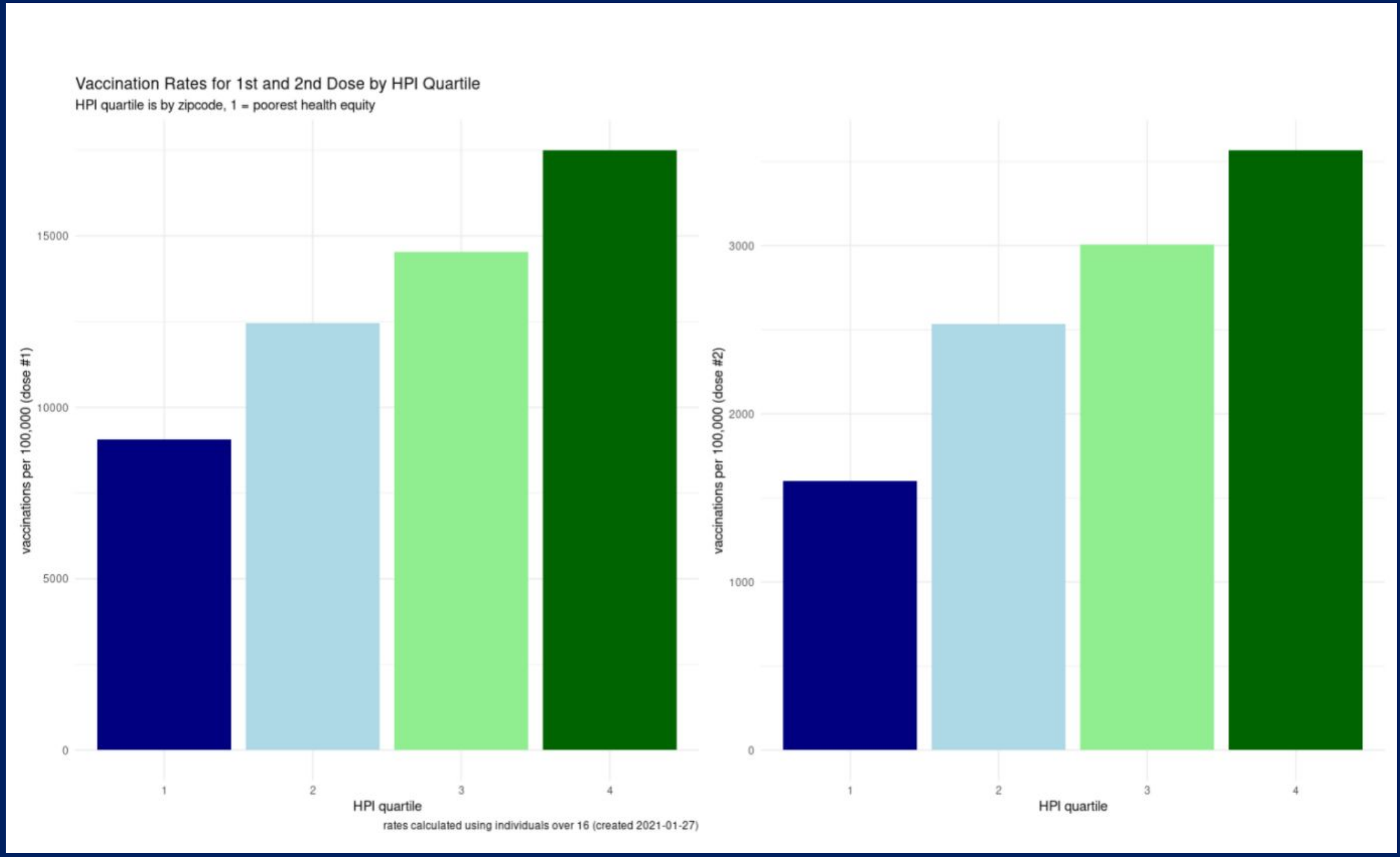
Test Positivity vs. HPI



Lowest HPI quartile

Highest positivity

Highest Latinx



preliminary data as of Jan 27, 2021

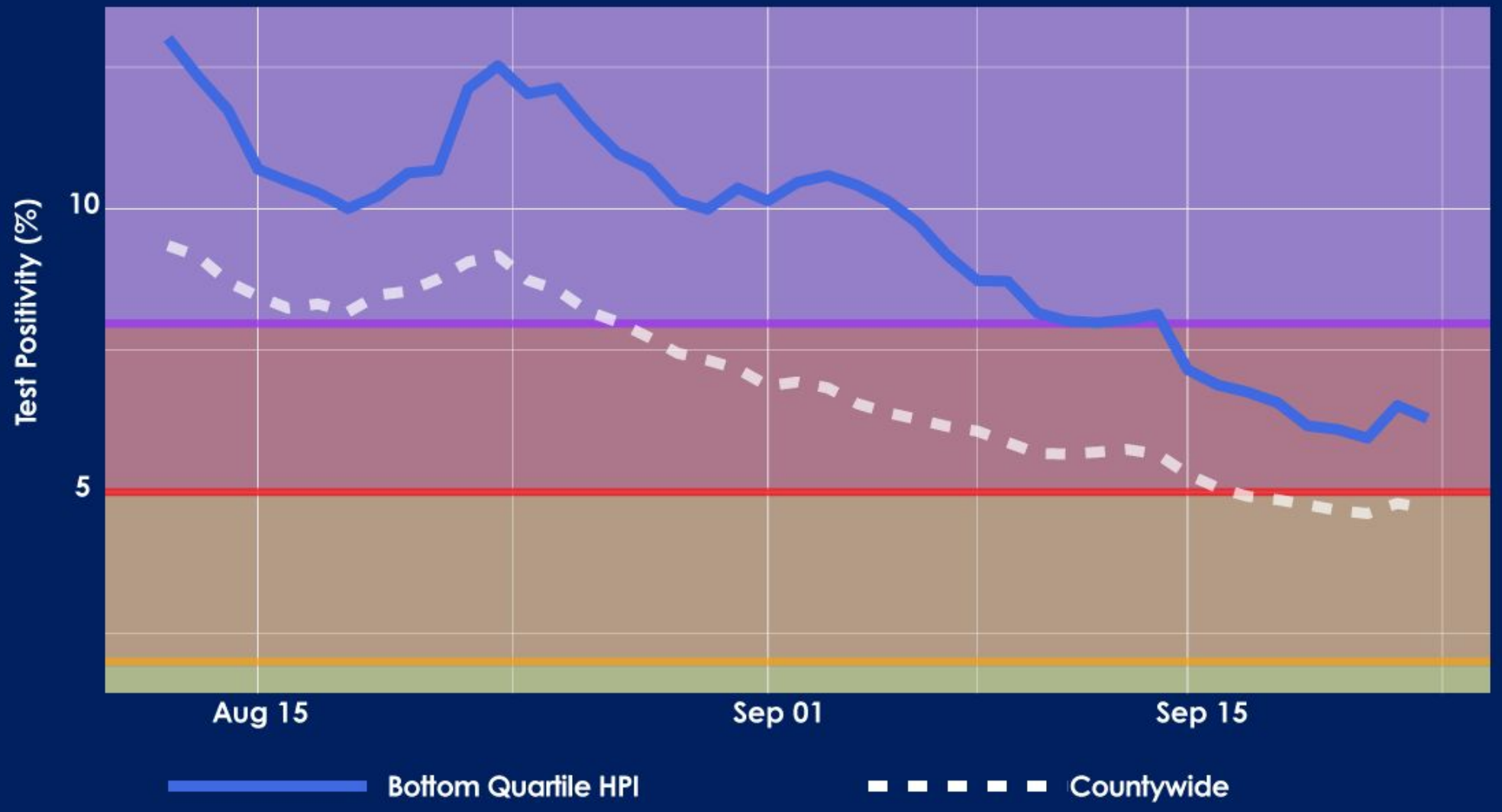
Vaccine Coverage Rate Ratios by HPI

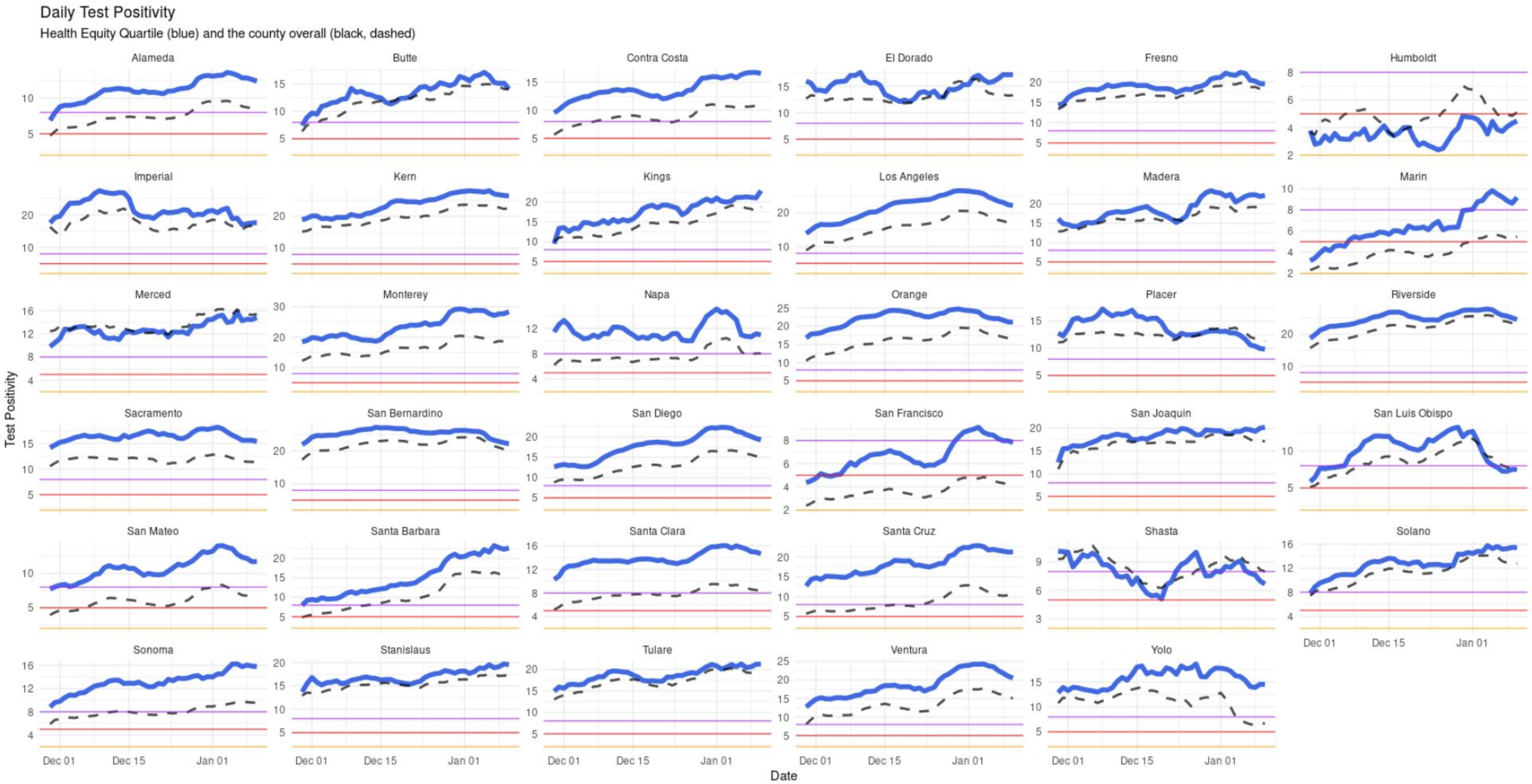
Early analysis with mostly 1A vaccinations, however this way of understanding the rollout will become more important as vaccination is opened up to more groups

HPI Quartile 1	Ratio (Q1/Q4)	HPI Quartile 4
37% of cases rate : 10,217/100,000	**3.24x**	11% of cases rate: 3,152/100,000
37% of deaths rate: 127/100,000	**3.38x**	11% of deaths rate: 38/100,000
1st dose rate: 2,560/100,000	**0.47x**	1st dose rate: 5,361/100,000
2nd dose rate: 291/100,000	**0.33x**	2nd dose rate: 861/100,000

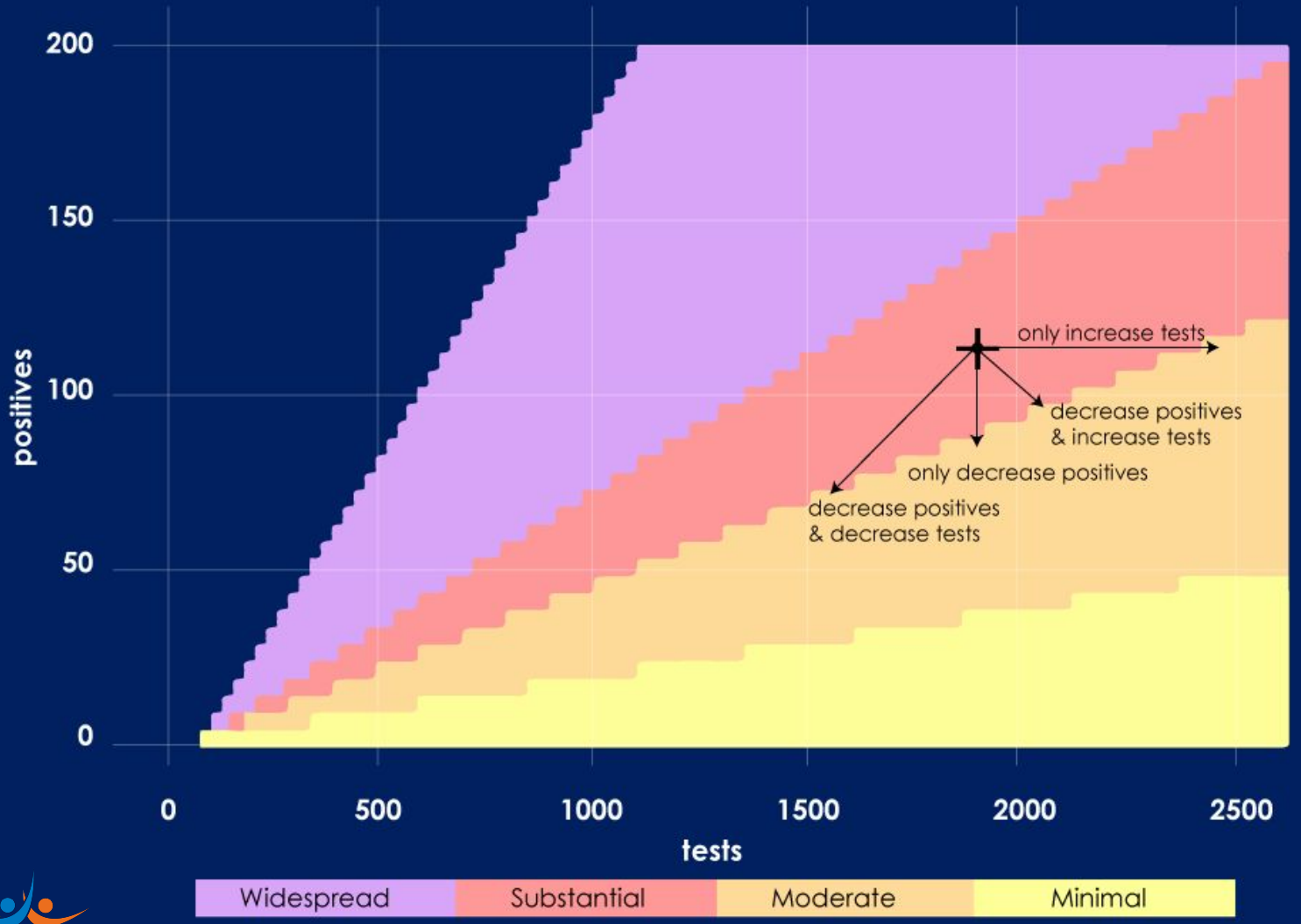
preliminary data as of Jan 15, 2021

The Health Equity Metric | Trends in Test Positivity




Daily Test Positivity
Health Equity Quartile (blue) and the county overall (black, dashed)
Alameda
Butte
Contra Costa
El Dorado
Fresno
Humboldt
Imperial
Kern
Kings
Los Angeles
Madera
Marin
Merced
Monterey
Napa
Orange
Placer
Riverside
Sacramento
San Bernardino
San Diego
San Francisco
San Joaquin
San Luis Obispo
San Mateo
Santa Barbara
Santa Clara
Santa Cruz
Shasta
Solano
Sonoma
Stanislaus
Tulare
Ventura
Yolo
Test Positivity
Dec 01
Dec 15
Jan 01
Date

The Health Equity Metric | Strategies



Addressing the Health Equity Metric involves a combination of approaches to impact the

- Numerator (controlling the spread), and
- the Denominator (testing volume)

The specific strategy for improving the HE Metric should be tailored to the context of the county (R-effective and resource availability).

COVID-19 Health Equity Playbook for Communities

Overview: Working Draft

Immediate COVID-19 Response Strategies

- Testing
- Contact Tracing
- Isolation Support
- Worker Protections

Medium and Longer-term COVID-19 Response Strategies

- Housing Security and Homelessness
- Economic Security
- Schools and Childcare
- Transportation / Physical Access and Mobility
- Health in All Policies (HiAP)/Governing for All

Cross cutting strategies

- Data
- Communication
- Language Access and Cultural Competency
- Community and Stakeholder Engagement

Section Content | Example

Within Each section:

- Principles
- Strategies
- Promising practices and Examples
- Resources

Example: Homelessness

- **Principles:**
  - Homelessness response requires expansive and cross sector collaboration
  - Place central focus on the lived experiences and needs of the unhoused population
  - Address the unique needs of unhoused subpopulations (unhoused youth and unhoused drug users)
  - Be aware of and address unhoused vulnerabilities to COVID-19:

- **Strategy A - Emergency Single Unit Housing for the Unhoused**
  - Provide single unit isolation capacity to protect unhoused population from COVID-19 in hotel and motel rooms.
  - Leverage and expand on state-level Project Roomkey which provided local governments and Continuums of Care for shelter support and emergency housing to address COVID-19 among the homeless and established occupancy agreements to secure rooms in hotels, motels, and other facilities.
    - Project Roomkey Fact Sheet
  - **Examples:**
    - City of Los Angeles- Project Roomkey expanded state-level Project Roomkey with a goal of 15,000 isolation motel/hotel units for Los Angeles. This initiative has been met with opposition and challenges but has also effectively been able to get participants into permanent housing faster the usual by setting up collaborative social services.

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Technical Assistance

Principles
Strategies
Promising practices and Examples
Resources

Goal: to provide fast, responsive regionally relevant technical assistance

Components

- Local Coordination Team
- ELC funding positions
  - Community engagement
  - Strategic Partnerships
- State Subject Matter Expert (within and outside of Public Health)
- Philanthropic funded efforts
  - PHI, Kaiser
- Regional Collaborative
  - BARHII, Public Health Alliance of Southern California, San Juaquin Valley Consortium
- Advocacy efforts
  - ChangeLab Solutions, California Pan Ethnic Health Network, Public Health Advocates, Prevention Institute

Health Equity Indices
Jan 19, 2021

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An Introduction to Datasets for Examining Social Determinants of Health in California

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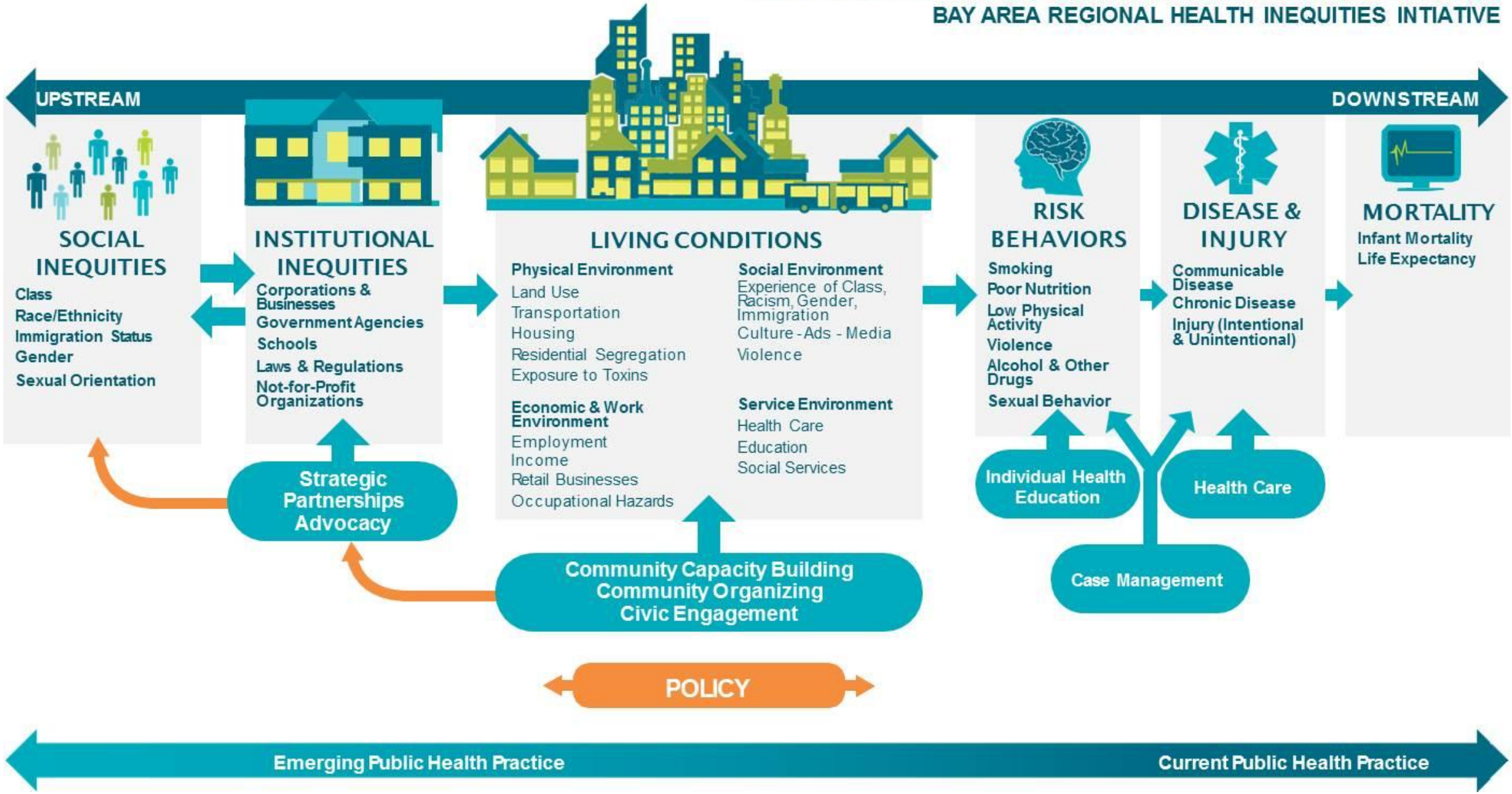
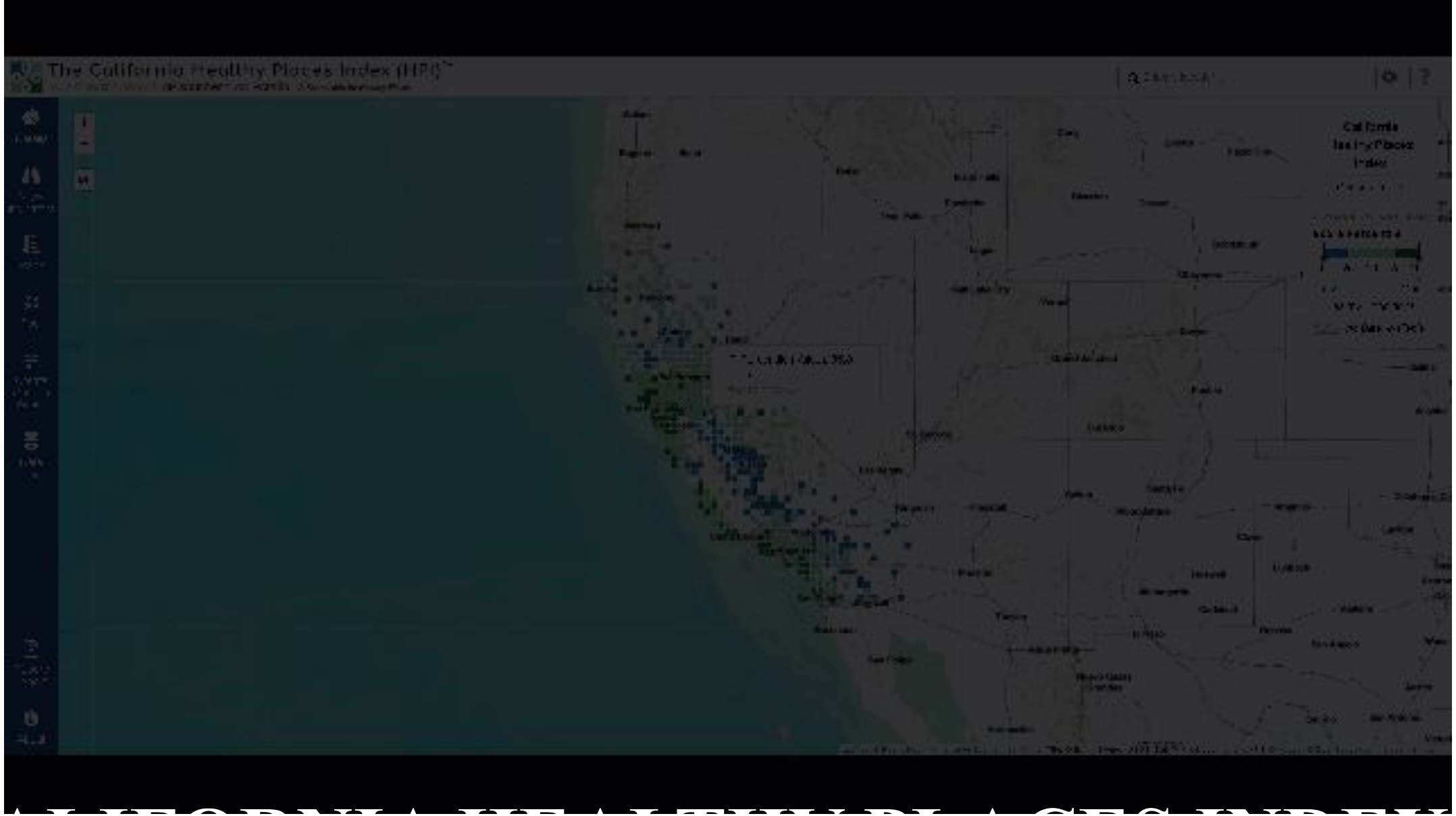
Jan 28, 2021

A PUBLIC HEALTH FRAMEWORK FOR REDUCING HEALTH INEQUITIES
BAY AREA REGIONAL HEALTH INEQUITIES INTIATIVE




The California Healthy Places Index (HPI)

Healthy Places Index

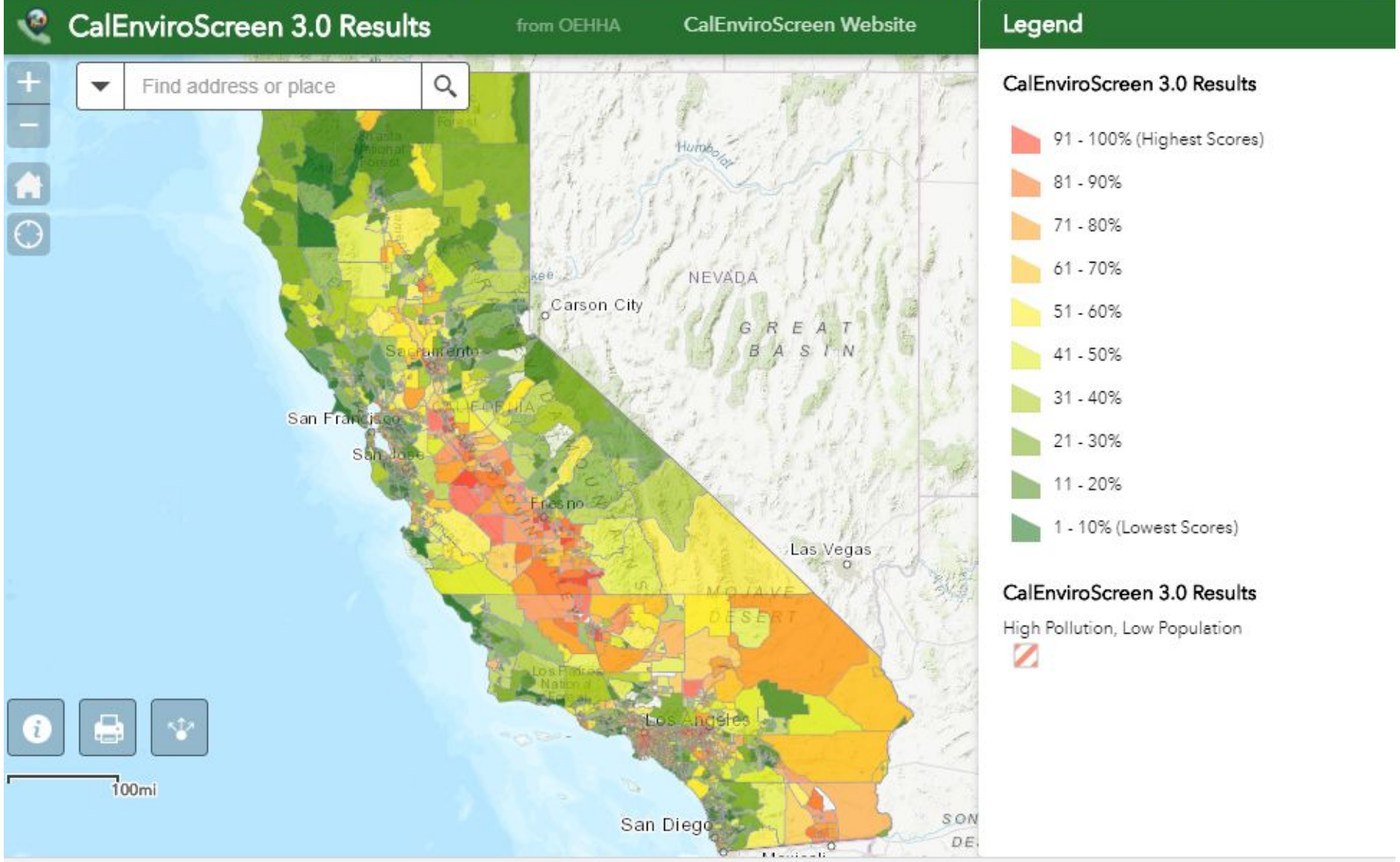
Domain	Indicator	Weight
Neighborhood	Retail Density Park Access Tree Canopy Supermarket Access Alcohol Outlets	**7.7%**
Clean Environment	Ozone concentrations in air PM 2.5 concentrations in air Diesel PM Water Contaminants	**5.2%**
Economic	Employment Income Poverty	**31.9%**
Social	Two Parent Household Voting (2012)	**10.4%**
Housing	Severe Housing Cost Burden (renter and homeowner) Housing Habitability Housing Crowding Homeownership	**5.2%**
Education	In Primary School In High School Bachelors Degree or higher	**18.7%**
Transportation	Automobile Access Active Commuting	**15.5%**
Healthcare	Health Insurance	**5.2%**

Healthy Places Index

24 indicators >>
8 Domains >>
1 Index

Indicators available at census tract scales.

Domains are weighted toward final index value based on association with life expectancy at birth.


CalEnviroScreen 3.0 Results
from OEHHA
CalEnviroScreen Website
Find address or place
Legend
CalEnviroScreen 3.0 Results
91 - 100% (Highest Scores)
81 - 90%
71 - 80%
61 - 70%
51 - 60%
41 - 50%
31 - 40%
21 - 30%
11 - 20%
1 - 10% (Lowest Scores)
CalEnviroScreen 3.0 Results
High Pollution, Low Population
NEVADA
Carson City
GREAT BASIN
San Francisco
San Jose
Fresno
Las Vegas
MOJAVE DESERT
Los Angeles
San Diego
100mi

CalEnviroScreen 3.0

Domain	Component	Indicator
Pollution Burden	Exposure	Ozone concentrations in air
		PM 2.5 concentrations in air
		Diesel particulate matter emissions
		Drinking water contaminants
		Use of certain high-hazard, high-volatility pesticides
		Toxic releases from facilities
		Traffic density
	Environmental Effects	Toxic cleanup sites
		Groundwater threats from leaking underground storage sites and cleanups
		Hazardous waste facilities and generators
		Impaired water bodies
		Solid waste sites and facilities
Population Characteristics	Sensitive Populations	Asthma emergency department visits
		Cardiovascular disease (emergency department visits for heart attacks)
		Low birth-weight infants
	Socioeconomic	Educational attainment
		Housing burdened low income households
		Linguistic isolation
		Poverty
		Unemployment

CalEnviroScreen 3.0

20 indicators >>
4 components >>
2 burdens >>
1 score

Statewide census tracts ranked by percentile and averaged to obtain component scores.

Component scores are combined (exposure overweighted) to burden scores (0-10).

Burden scores are multiplied together (0-100).

OTHER DATA SETS

HEALTH

CA Community Burden **http://cdph.ca.gov/communityburden**

CDC 500 cities Data **https://www.cdc.gov/500cities/index.htm**

California Environmental Health Tracking Program **http://cehtp.org/**

California Health Interview Survey Neighborhood Edition **http://askchisne.ucla.edu/**

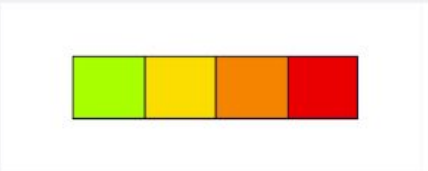
INDICES

Regional Opportunity Index
https://interact.regionalchange.ucdavis.edu/roi/index.html

CDC Social Vulnerability Index **https://svi.cdc.gov/**

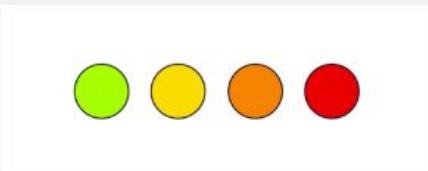
- Area Deprivation Index **https://www.neighborhoodatlas.medicine.wisc.edu/**
- UCSF Health Atlas **https://healthatlas.ucsf.edu/**
- SURGOS COVID Community Vulnerability Index **https://precisionforcovid.org/ccvi**

How Do I Read These Charts?



SCATTERPLOTS, MAPS, HEAT MAPS

We use these colors primarily in scatterplots charts or geographic and heat maps



DISPARITY/PERFORMANCE

Colors measuring average / aggregate disparity or performance from lower (green) to higher (red)

BAR CHART COMPARISONS

In plotting bar charts, especially on county and city comparison pages, we use two colors: yellow (primary/county) and orange (secondary/city)

PURPLE COMPARISON

A third color of purple is added to bar charts when comparing two cities against the county average. The second city is purple. Yellow remains county. And orange is the initial city. Purple is also a color used in maps and charts that don't directly compare with other data sets.

BEST AND LOW RATE

The best rate is not the same as the best outcome. The best rate applies to the racial group which has the best performance on an indicator (e.g., highest graduation rate or lowest poverty rate).

Seven Key Issues

KEY ISSUE

Crime and Justice

KEY ISSUE

Democracy

KEY ISSUE

Economic Opportunity

KEY ISSUE

Education

KEY ISSUE

Health Care Access

KEY ISSUE

Healthy Built Environment

KEY ISSUE

Housing

racecounts.org

RACE COUNTS

• STATE ▾ COUNTIES ▾ CITIES ▾ ISSUES • MAP • CAMPAIGNS ▾ DATA ▾ ABOUT

GET A 3D VIEW OF RACIAL EQUITY

Performance. Disparity. Impact.

Impact: The total population for each county and therefore how many people are affected. For example, how many people live in a county where graduation rates are high, but Black students don't graduate as often as other racial groups?

SURVEY