

# COVID-19, HEALTH INEQUITIES, DATA GAPS + SOLUTIONS

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Equity  
Task Force  
“Data challenges and  
opportunities”  
(virtual)  
February 26, 2021

## COVID-19 inequities in:

- (1) exposure, due to working & living conditions
- (2) risk of dying, if infected, due to pre-existing social, economic, and health inequities
- (3) vaccine roll-outs & access & institutional mistrust
- (4) data for action to change these terrible facts

### COVID-19 Dashboard

Last Updated at (M/D/YYYY)  
2/23/2021, 8:23 AM

Cases by Country/Region  
/Sovereignty

28,191,213 US

11,016,434 India

10,195,160 Brazil

4,142,126 Russia  
Global Deaths

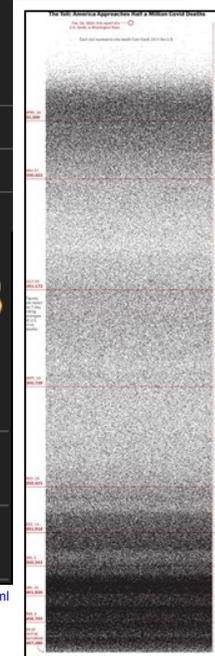
2,476,668

500,443 deaths  
US

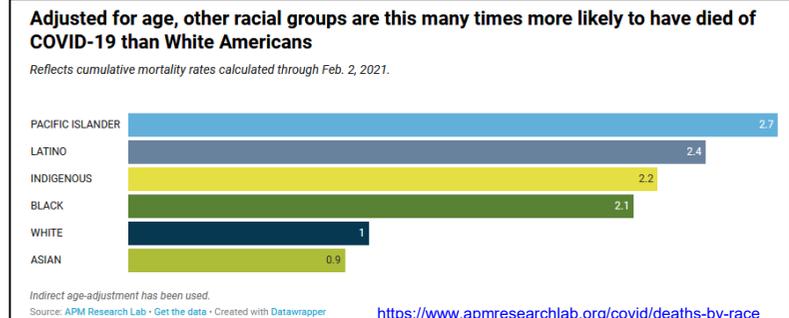
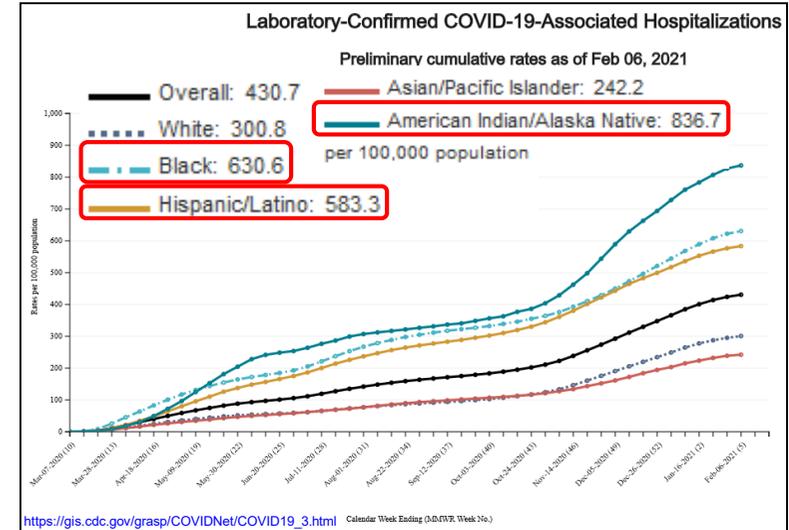
247,143 deaths  
Brazil

180,536 deaths  
Mexico

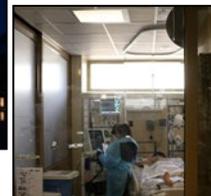
<https://www.arcgis.com/apps/opsdashboard/index.html#/bda7594740fd40299423467b48e9ecf6>



<https://static01.nytimes.com/images/2021/02/21/nyfronpage/scan.pdf>



<https://www.nytimes.com/live/2021/02/23/world/covid-19-coronavirus-us-covid-deaths-half-a-million>



	Percent of Vaccinations	Alabama, as of Feb 16, 2021 Percent of Cases	Percent of Deaths	Percent of Total Population
Black	17%	29%	31%	27%
White	80%	58%	65%	68%
Latino	2%	7%	2%	4%

<https://www.kff.org/coronavirus-covid-19/issue-brief/latest-data-on-covid-19-vaccinations-race-ethnicity/>

# HEALTH INEQUITIES & THE TWO-EDGED SWORD OF DATA

**DATA: NEVER A “GIVEN”** – despite being past participle of Latin verb “dare,” to give – **ALWAYS** must ask:

-- Who produces & controls the data? – i.e., who is vs is not at the proverbial table?

-- And be aware of long US histories of contested production & use of racialized data, in relation to:

*(1) scientific racism + eugenics vs. (2) social justice + equity*

**SWORD EDGE 1:** “No data, no problem” (denial)



The point:  
data to secure  
health justice

**SWORD EDGE 2:** “Problematic data, big problem”

**EDGE 1:**  
“no data,  
no problem”

# **COVID-19 & MISSING DATA: denial of inequities & erasure of structural injustice**

## **Missing data on race/ethnicity**

**Early months of the pandemic (2020):**

**Feb & March: racial/ethnic data missing from CDC for cases, hospitalizations, deaths**

**April: journalists, politicians, and public health professionals & advocates demand data**

**June 4: new regulations mandating these data be reported by August 1, 2020**

**BUT:**

**-- Sept 16, 2020: checked the CDC website – and determined that race/ethnicity was missing for 43% of COVID-19 cases added between Aug 28, 2020 and Sept 16, 2020**

**-- Feb 4, 2021: checked again, and these data still missing for 33% of COVID-19 cases reported between December 2, 2020 and February 3, 2021**

**Ongoing problems: missed opportunity to get it right with vaccination data**

**Feb 1: CDC reported racial/ethnic data missing for 48.1% of persons vaccinated against COVID-19 in the 1<sup>st</sup> month of roll-out (Dec 14, 2020-Jan 14, 2021), but only 0.1% and 3% were missing data respectively on age and sex – and once again, demands for these data**

**AND: no economic, occupational, community, or other contextual data, leaving the decontextualized racial/ethnic data open to narratives of victim-blaming**

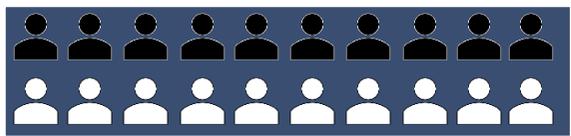
# EDGE 2: “problematic data, big problems”

# PROBLEMATIC PROPORTIONS: Part 1

True (Unweighted) State Population  
30% (12/40) POC

CDC Weight  
% of total COVID-19 deaths

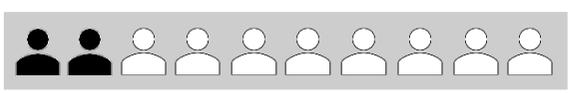
Weighted State Population  
46.7% (8.4/18) POC



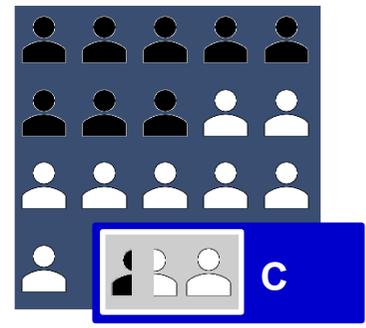
× 80% (2/5)



× 0% (0/5)



× 20% (1/5)

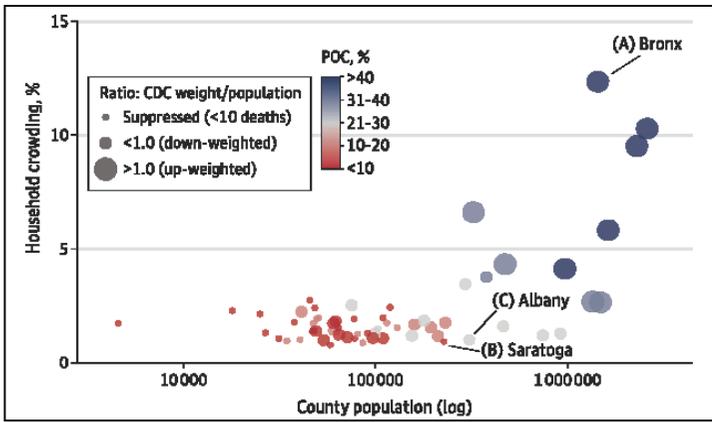


County A: Similar to Bronx  
50% (10/20) POC; n=4 (80%) deaths

County B: Similar to Saratoga  
0% (0/10) POC, n=0 (0%) deaths

County C: Similar to Albany  
20% (2/10) POC; n=1 (20%) deaths

Figure. (1) Simplified example of CDC’s geographical weighting using a fictitious state with three counties & (2) Actual CDC weighting of counties in New York State by population, household crowding, and percent of county population who are people of color



Data as of May 13, 2020	Percent of Distribution			Comparison to CDC/NCHS Weighted population		Comparison to Census population (Unweighted)	
	COVID-19 Deaths <sup>2</sup>	CDC/NCHS Weighted Pop.	U.S. Census Pop.	Difference <sup>5</sup>	Ratio <sup>6</sup>	Difference <sup>5</sup>	Ratio <sup>6</sup>
Racial/ethnic group <sup>1</sup>							
American Indian and Alaska Native (AIAN) <sup>5</sup>	0.4%	0.2%	0.7%	0.2%*	2.00*	-0.3%	0.57
Asian American	5.8%	11.5%	5.7%	-5.7%	0.50	0.1%*	1.02*
Black	22.4%	18.2%	12.5%	4.2%*	1.23*	9.9%*	1.79*
Latinx	16.6%	26.8%	18.3%	-10.2%	0.62	-1.7%	0.91
Other Race <sup>6</sup>	2.5%	1.9%	2.4%	0.6%*	1.32*	0.1%*	1.04*
White	52.3%	41.4%	60.4%	10.9%*	1.26*	-8.1%	0.87

Figure 2

Type III error:  
right answer to  
wrong question

Source: Cowger et al, JAMA Open Network, July 28, 2020

# EDGE 2:

“problematic data, big problems”

# PROBLEMATIC PROPORTIONS: Part 2

**Current CDC website:  
0 total population data**

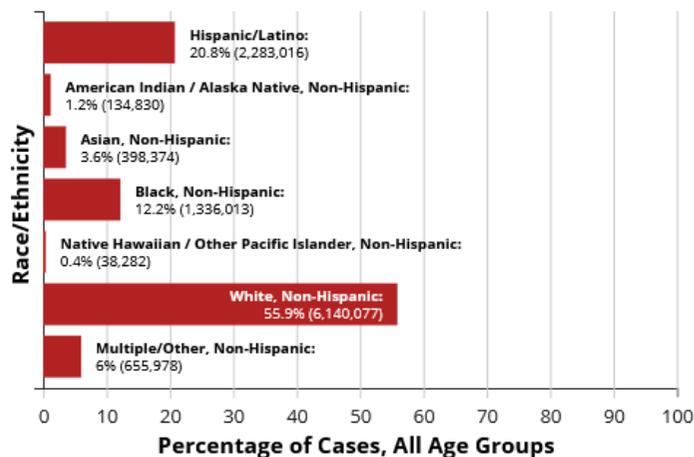
CDC | Updated: Feb 22 2021 12:24PM

## Cases by Race/Ethnicity:

Download

Data from 21,123,263 cases. Race/Ethnicity was available for 10,986,570 (52%) cases.

All Age Groups

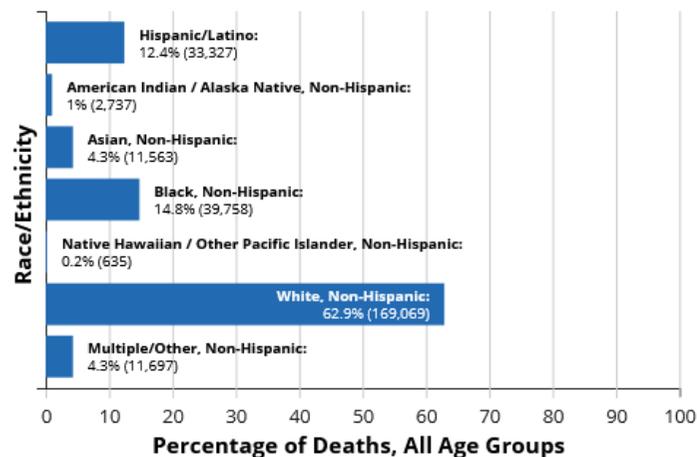


## Deaths by Race/Ethnicity:

Download

Data from 360,375 deaths. Race/Ethnicity was available for 268,786 (74%) deaths.

All Age Groups

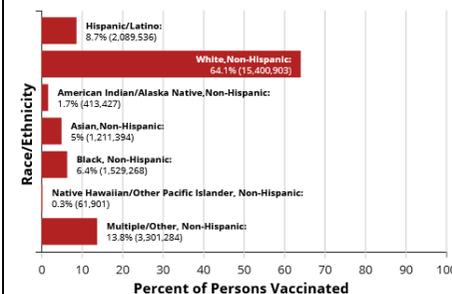


**And SAME problem for the vaccination data:**

## Race/Ethnicity of People with 1 or More Doses Administered:

Download

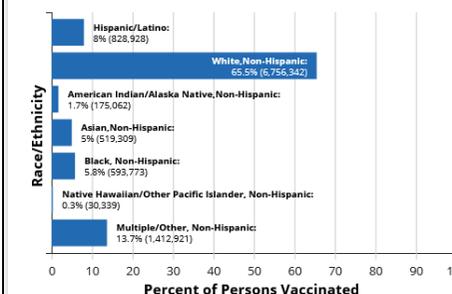
Data from 44,138,118 people with 1 or more doses administered. Race/Ethnicity was available for 24,007,713 (54.4%) people with 1 or more doses administered.



## Race/Ethnicity of People with 2 Doses Administered:

Download

Data from 19,438,495 people with 2 doses administered. Race/Ethnicity was available for 10,316,674 (53.1%) people with 2 doses administered.



<https://covid.cdc.gov/covid-data-tracker/#demographics>

# COVID-19 IN THE US: IT IS FEASIBLE TO DOCUMENT HEALTH INEQUITIES, NOW

## Examples (from our unfunded team\*):

- April 19: we reported US COVID-19 mortality by county-level metrics of inequities
- May 9: we reported on the surge in MA excess deaths by city/town & ZIP Code metrics
- Oct 5: we reported on national complaints to OSHA in relation to COVID-19 death rates

**This week: using data newly showing up on the CDC website, we report on national COVID-19 mortality by race/ethnicity + education**

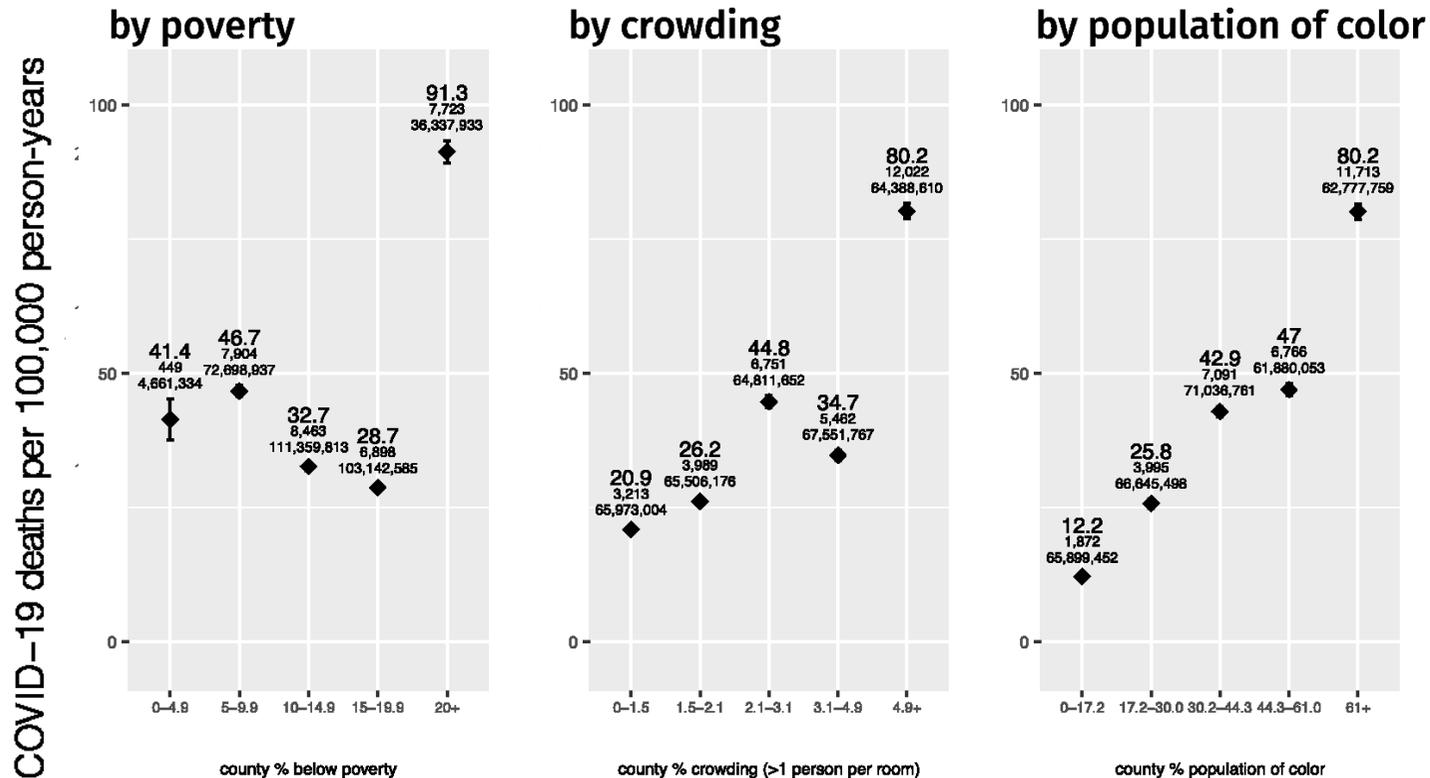
• Core team members: Nancy Krieger, Jarvis T. Chen, Pamela D. Waterman, Christian Testa  
• Source: Krieger et al, 2020 (HSPH Public Health Disparities Geocoding Project website) -- see: <https://www.hsph.harvard.edu/thegeocodingproject/covid-19-resources/>



The Harvard Center for Population and Development Studies

# Inequities in US COVID-19 Deaths

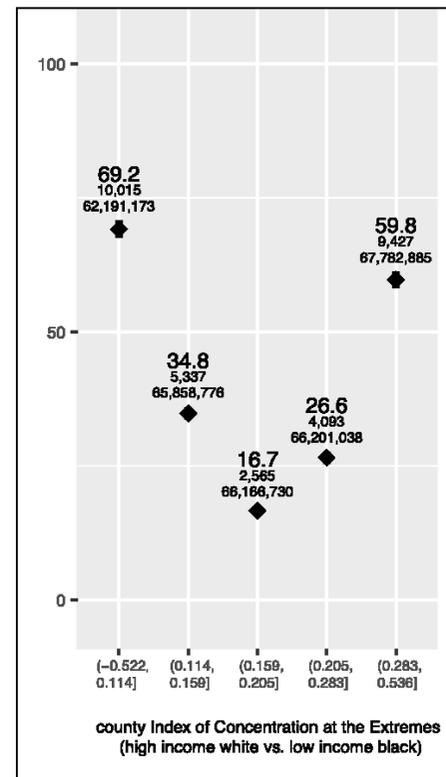
(as of April 16, 2020)



people living in the most disadvantaged counties have the **highest** COVID-19 death rates

Source: Chen JT, Krieger N. Revealing the unequal burden of COVID-19 by income, race/ethnicity, and household crowding: US county vs ZIP code analyses. *Harvard Center for Population and Development Studies Working Paper Series*, Volume 19, Number 1. April 21, 2020. <https://tinyurl.com/ya44we2r>

## ICE for racialized economic segregation



$$ICE_i = (A_i - P_i)/T_i$$

where:

$A_i$  = N of most privileged  
 $P_i$  = N of most deprived  
 $T_i$  = total N

- 1 = 100% deprivation  
 1 = 100% privilege

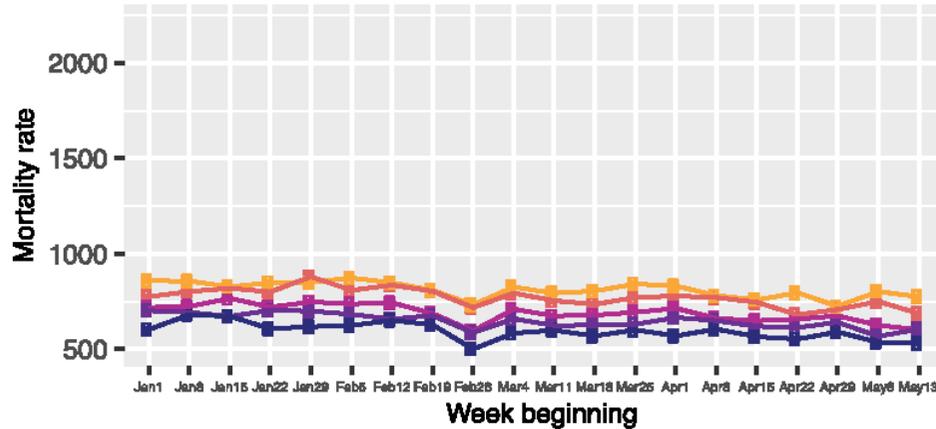
# A new analysis: Coronavirus death rate surged in Massachusetts locations that already faced challenges

Harvard analysis finds mortality rate surged higher in communities with more poverty, people of color, and crowded housing. *Boston Globe front page*  
 By Andrew Ryan and Kay Lazar Globe Staff. Updated May 9, 2020, 3:53 p.m. **Sun, May 10, 2020**

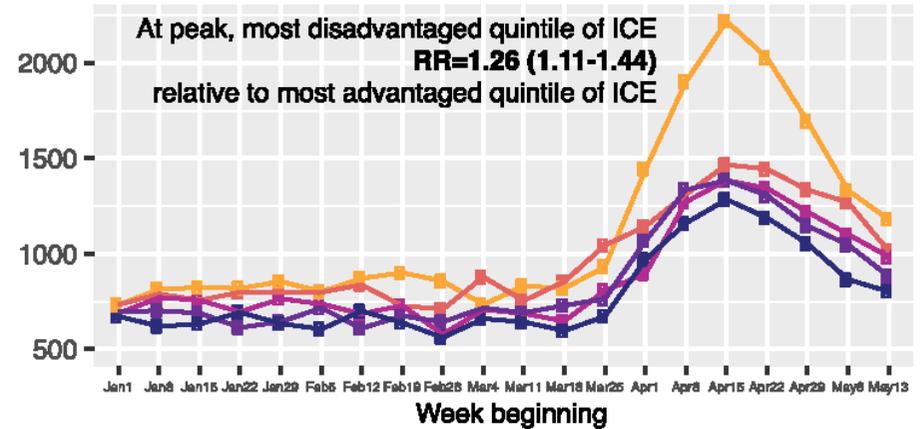
# COVID-19 and Overall Mortality Inequities in the Surge in Death Rates by Zip Code Characteristics: Massachusetts, January 1 to May 19, 2020

Nancy Krieger, PhD, Pamela D. Waterman, MPH, and Jarvis T. Chen, ScD **AJPH** December 2020, Vol 110, No. 12

By Index of Concentration at the Extremes, 2015–2019



By Index of Concentration at the Extremes, 2020



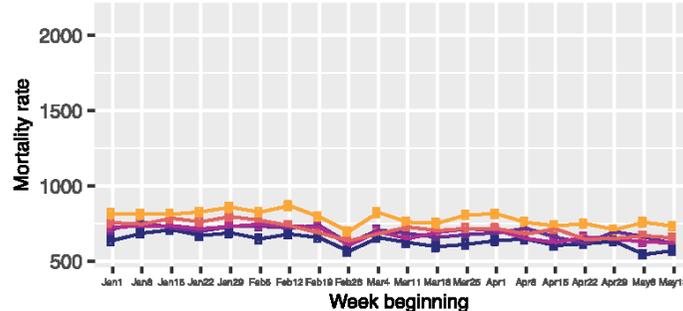
Index of Concentration at the Extremes

- [-0.531,0.0648]
- (0.0648,0.265]
- (0.265,0.369]
- (0.369,0.46]
- (0.46, 1]

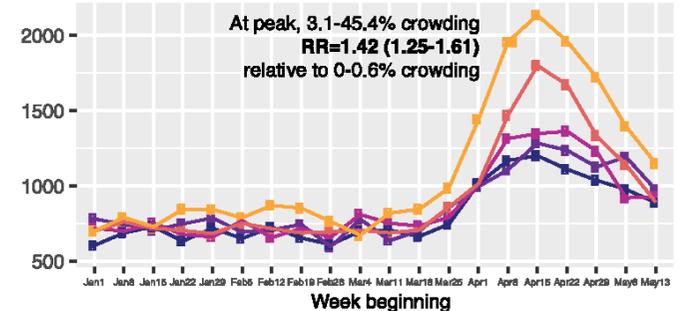
## ICE for racialized economic segregation: Range:

- 1 = 100% low-income households of color
- 1 = 100% high-income white non-Hispanic households

By % crowding, 2015–2019



By % crowding, 2020



% crowding

- 0-0.6%
- 0.6-1.2%
- 1.2-1.9%
- 1.9-3.1%
- 3.1-45.4%

# US worker complaints to OSHA about COVID-19 risk and COVID-19 mortality (US national data, January 16-September 18, 2020)

Fig 1. National OSHA complaints and COVID—19 deaths per million (7 Day Average), January 16-September 18, 2020

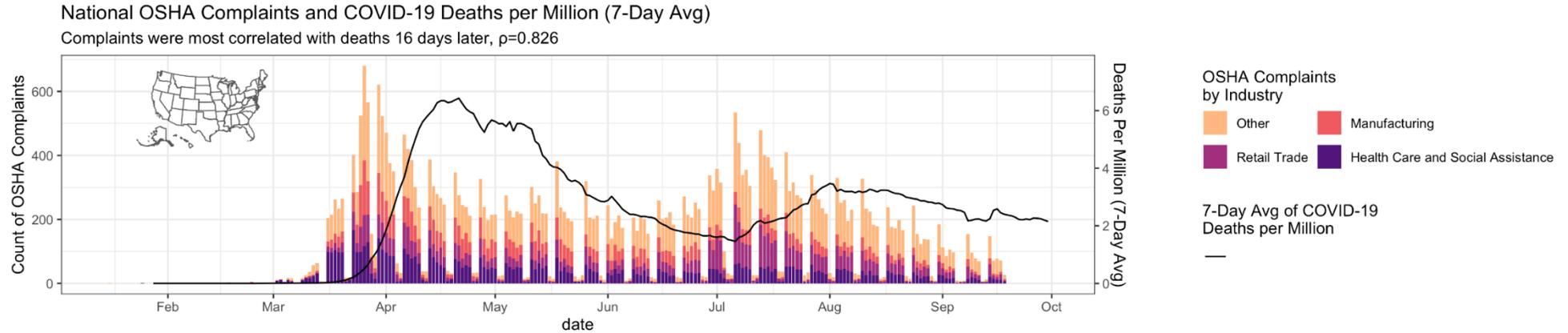
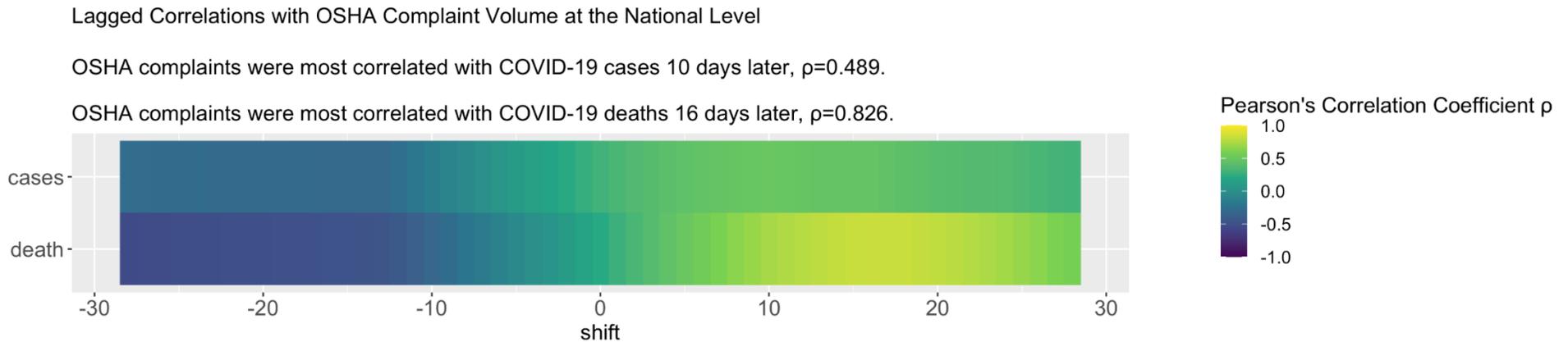


Fig 2. Heatmaps showing the lagged correlations between OSHA complaint volume and COVID-19 cases and COVID-19 deaths, nationally and by US region, January 16, 2020—September 30, 2020

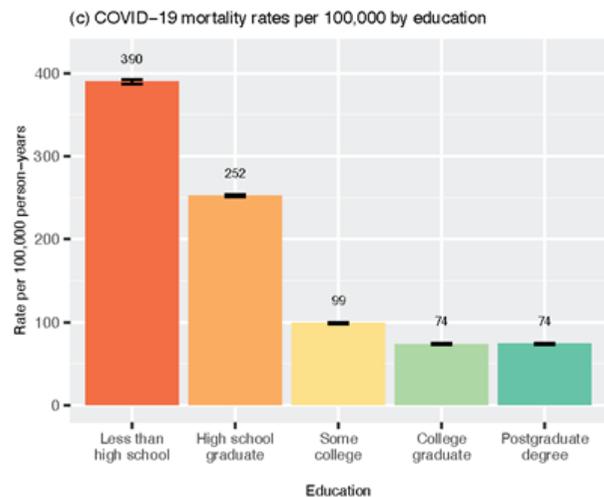
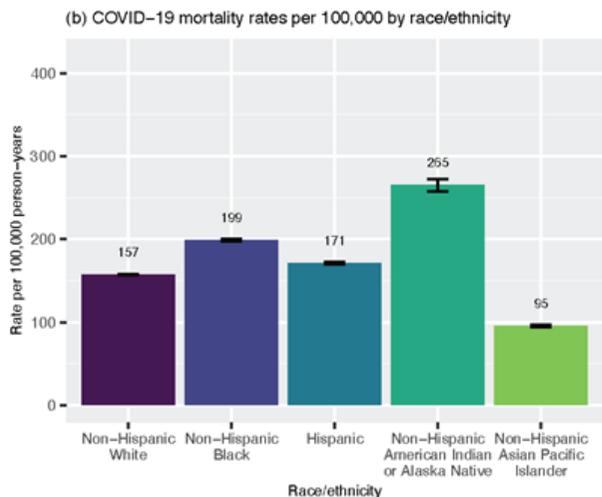


# DATA NEWLY AVAILABLE AT CDC (AFTER JAN 20, 2021)

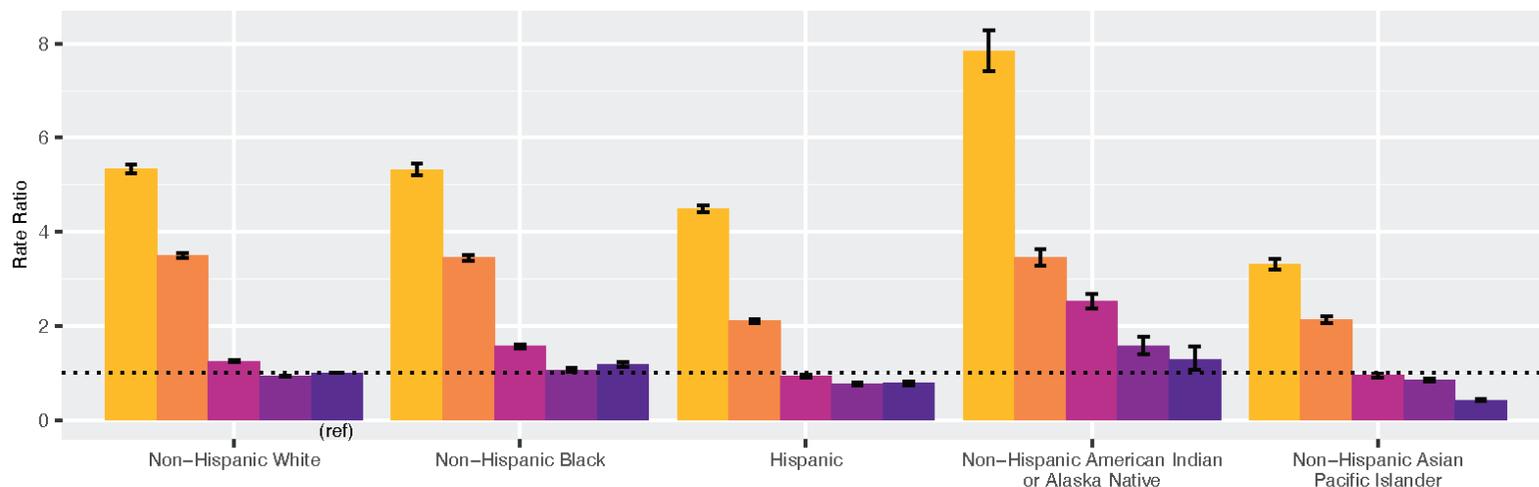
**COVID-19 Mortality rates  
(per 100,000 person-years)  
and rate ratios:  
Jan 1, 2020 – Jan 31, 2021**

**Note: education has been a standard variable  
on the standard death certificate since 1989!**

**Note:  
occupation is  
ALSO on the  
standard death  
certificate –  
especially  
relevant to  
working-age  
adults**



(c) COVID-19 mortality: Rate ratios relative to Non-Hispanic Whites with Postgraduate degree



Covid-19 mortality rate per 100,000 py	426	278	99	75	80	425	275	125	85	94	358	168	74	61	63	625	276	201	126	103	264	170	76	68	34
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Education ■ Less than high school ■ High school graduate ■ Some college ■ College graduate ■ Postgraduate degree

# COVID-19, DATA, & HEALTH JUSTICE: THE POINT IS HEALTH EQUITY

## NEED BETTER DATA TO INFORM ACTION

- REVEAL RACIALIZED ECONOMIC HEALTH INEQUITIES, IN REAL TIME
- ALWAYS PRESENT COVID DATA BY RACIALIZED + ECONOMIC GROUP  
for: testing, cases, hospitalization, deaths & vaccination -- & by age + gender



**“We cannot  
direct the wind,  
but we can  
adjust the sail.”**

**Jamaica Pond, MA,  
May 2020**

**(photo: N. Krieger)**

Eur J Epidemiol (epub Nov 2, 2020)

## Recommendations:

- immediate: use informative contextual ZIP Code data for ALL COVID-19 outcomes**  
use individual-level education & occupation data (for mortality data)  
use real-time US Census Household Pulse survey data (states & 15 big MSAs)  
create real-time public roster of new social data CDC is adding for COVID-19
- bigger picture: structural problems require structural solutions**
- ensure data reveal problems tied to work conditions, crowded housing, lack of paid sick leave, lack of health care, & congregate living (including for incarcerated persons)
  - mandate *all racialized data must be reported with contextualized social metrics* and mandate funds for the necessary resources (people & technology) to do the work
  - expand data governance to ensure real representation of those whose lived experiences of inequities are being documented, so this is done fairly & shows structural causes

## **Citations included in the presentation**

- Krieger N, Gonsalves G, Bassett MT, Hanage W, Krumholz HM. The fierce urgency of now: closing glaring gaps in US surveillance data on COVID-19. *Health Affairs Blog*, April 14, 2020. <https://www.healthaffairs.org/doi/10.1377/hblog20200414.238084/full/>
- Krieger N. COVID-19, data, and health justice. *To the Point*. Commonwealth Fund, April 16, 2020. <https://doi.org/10.26099/pz58-k702>
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- Krieger N. [Structural racism, embodied histories, and COVID-19 in context: lessons from the United States](#). Invited inaugural Vohra Miller Lectures on Critical Public Health Issues, for inaugural event on “Race, Racism, and COVID-19.” *Institute for Pandemics, Dalla Lana School of Public Health, University of Toronto, Toronto, Canada* (virtual), November 24, 2020. <https://youtu.be/hmj90R4Fzls?t=424>
- Krieger N, Chen JT, Waterman PD. Using the methods of the Public Health Disparities Geocoding Project to monitor COVID-19 inequities and guide action for health justice (May 15, 2020). Freely available at: <https://www.hsph.harvard.edu/thegeocodingproject/covid-19-resources/>
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- Krieger N, Testa C, Hanage WP, Chen JT. US racial and ethnic data for COVID-19: still missing-in-action (letter). *Lancet* 2020; 396(10261):e81. (Epub 2020 Oct 22) DOI: [https://doi.org/10.1016/S0140-6736\(20\)32220-0](https://doi.org/10.1016/S0140-6736(20)32220-0)
- Krieger N, Waterman PD, Chen JT, Testa C, Hanage WP. Plague of US missing COVID-19 data for race/ethnicity: debacle continues with vaccination data. (letter). *Lancet* (in press); see also: [https://cdn1.sph.harvard.edu/wp-content/uploads/sites/1266/2021/02/21\\_Krieger\\_Waterman-et-al\\_missing-data-on-race-continues-w\\_vaccine\\_HCPDS-Vol-21\\_No-1\\_FINAL\\_AB.pdf](https://cdn1.sph.harvard.edu/wp-content/uploads/sites/1266/2021/02/21_Krieger_Waterman-et-al_missing-data-on-race-continues-w_vaccine_HCPDS-Vol-21_No-1_FINAL_AB.pdf)
- Cowger TL, Davis BA, Etkins OS, Makofone K, Lawrence JA, Bassett MT, Krieger N. Comparison of Weighted and Unweighted Population Data to Assess Inequities in Coronavirus Disease 2019 Deaths by Race/Ethnicity Reported by the US Centers for Disease Control and Prevention. *JAMA Netw Open*. 2020; 3(7):e2016933. doi:10.1001/jamanetworkopen.2020.16933 <https://jamanetwork.com/journals/jamanetworkopen/fullarticle/2768722>
- Chen JT, Krieger N. Revealing the unequal burden of COVID-19 by income, race/ethnicity, and household crowding: US county versus ZIP Code analyses. *J Public Health Manag Pract* 2021; 27(Suppl 1):S43-S56 (Epub 2020 Sept 9). doi: 10.1097/PHH.0000000000001263 [https://journals.lww.com/jphmp/Fulltext/2021/01001/Revealing\\_the\\_Unequal\\_Burden\\_of\\_COVID\\_19\\_by.8.aspx](https://journals.lww.com/jphmp/Fulltext/2021/01001/Revealing_the_Unequal_Burden_of_COVID_19_by.8.aspx)
- Chen JT, Testa C, Waterman PD, Krieger N. Intersectional inequities in COVID-19 mortality by race/ethnicity and education in the United States, January 1, 2020 – January 31, 2021. Harvard Center for Population and Development Studies, Volume 21, No. 3, February 23, 2021. [https://cdn1.sph.harvard.edu/wp-content/uploads/sites/1266/2021/02/21\\_Chen\\_covidMortality\\_Race\\_Education\\_HCPDS\\_WorkingPaper\\_Vol-21\\_No-3\\_Final\\_footer.pdf](https://cdn1.sph.harvard.edu/wp-content/uploads/sites/1266/2021/02/21_Chen_covidMortality_Race_Education_HCPDS_WorkingPaper_Vol-21_No-3_Final_footer.pdf)

## EXTRA

### Additional references for the extra slides:

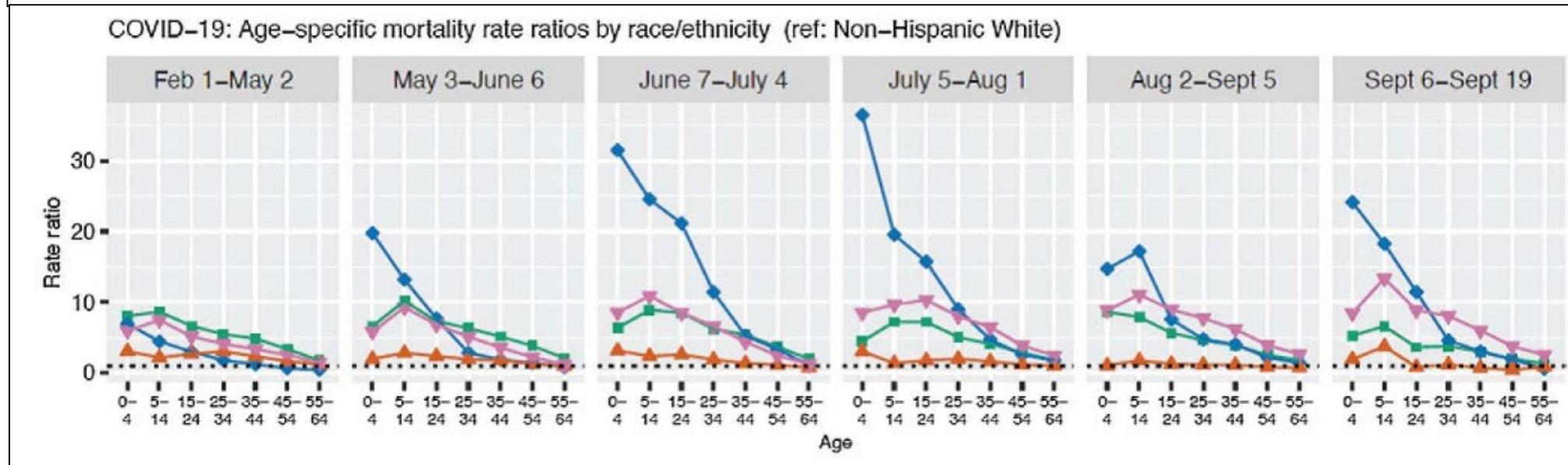
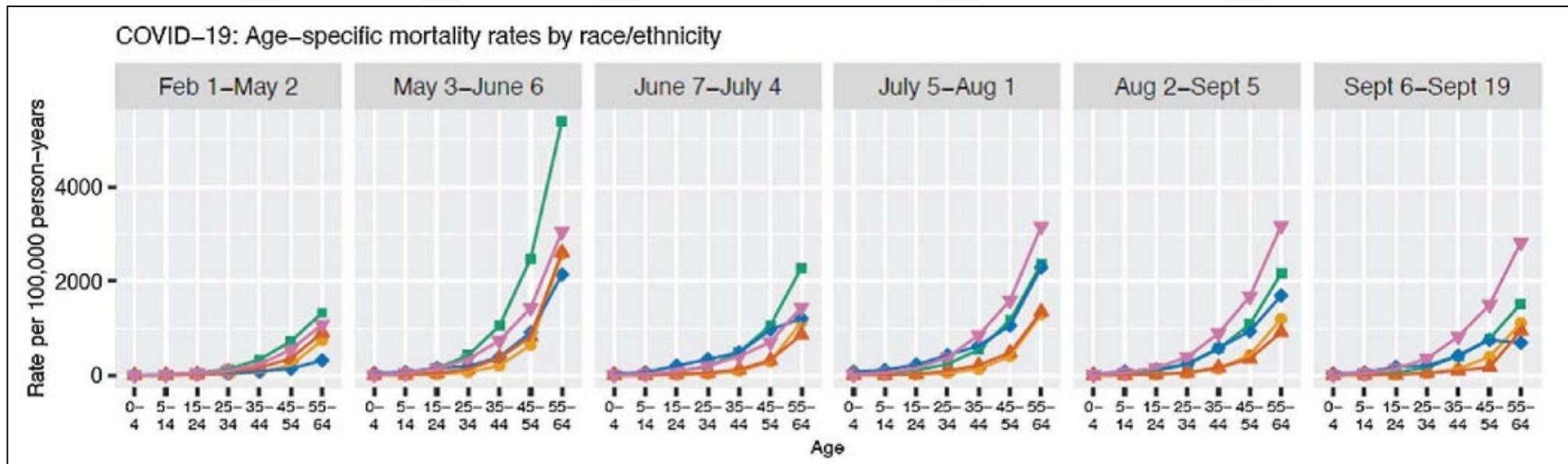
- Krieger N, Testa C, Waterman PD, Chen JT. Attack America's overlapping miseries: Why going big on relief is an economic, public health, and moral imperative. *New York Daily News*, February 17, 2021. <https://www.nydailynews.com/opinion/ny-oped-why-we-must-go-big-on-relief-20210217-jqpvsicyqr5hdeqxcc4rg5ya-story.html>  
-- for the detailed data and figures, see: Krieger N, Testa C, Waterman PD, Chen JT. Go big on relief! – repairing the commingled miseries of COVID-19 and US housing and food insecurity. Harvard Center for Population and Development Studies Working Paper, Volume 21, Number 2, February 13, 2021. [https://cdn1.sph.harvard.edu/wp-content/uploads/sites/1266/2021/02/21\\_krieger-et-al\\_C19HH-pulse\\_HCPDS\\_Vol-21\\_No-2\\_Final.pdf](https://cdn1.sph.harvard.edu/wp-content/uploads/sites/1266/2021/02/21_krieger-et-al_C19HH-pulse_HCPDS_Vol-21_No-2_Final.pdf)
- Krieger N, Testa C, Chen JT, Waterman PD, Hanage WP. A warning against using static US county-level community data to guide equity in COVID-19 vaccine distribution: temporal and spatial correlations of community characteristics with COVID-19 cases and deaths vary enormously and are increasingly uninformative. Harvard Center for Population and Development Studies Working Paper, Volume 20, Number 5, December 1, 2020. [https://cdn1.sph.harvard.edu/wp-content/uploads/sites/1266/2020/12/20\\_Krieger-et-al\\_equity-in-vaccine-distribution\\_Volume-20\\_No-5\\_final.pdf](https://cdn1.sph.harvard.edu/wp-content/uploads/sites/1266/2020/12/20_Krieger-et-al_equity-in-vaccine-distribution_Volume-20_No-5_final.pdf)

# COVID-19 AGE-SPECIFIC RACIAL/ETHNIC MORTALITY INEQUITIES & AGE

(US national data, February 1-September 19, 2020)

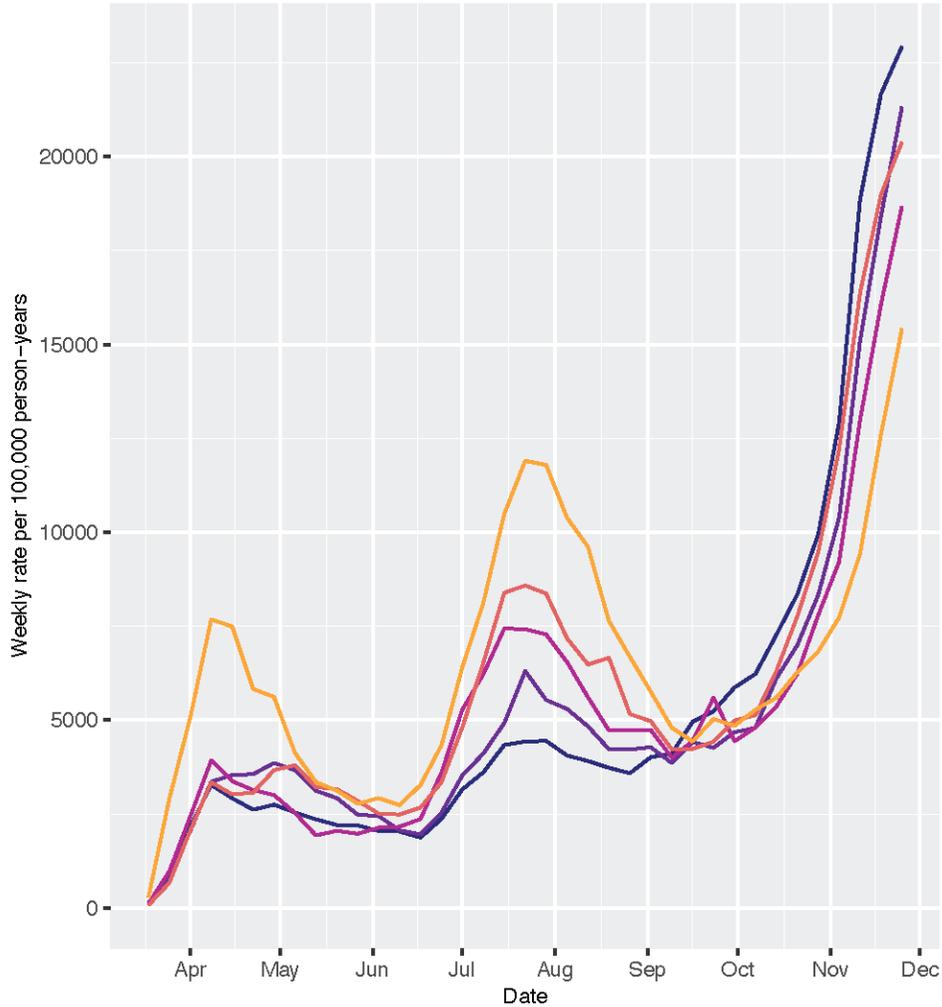
Source: Hanage et al, *Eur J Epidemiol* (epub Nov 2, 2020)

—●— Non-Hispanic White 
 —■— Non-Hispanic Black 
 —◆— Non-Hispanic American Indian or Alaska Native 
 —▲— Non-Hispanic Asian or Pacific Islander 
 —▼— Hispanic or Latino



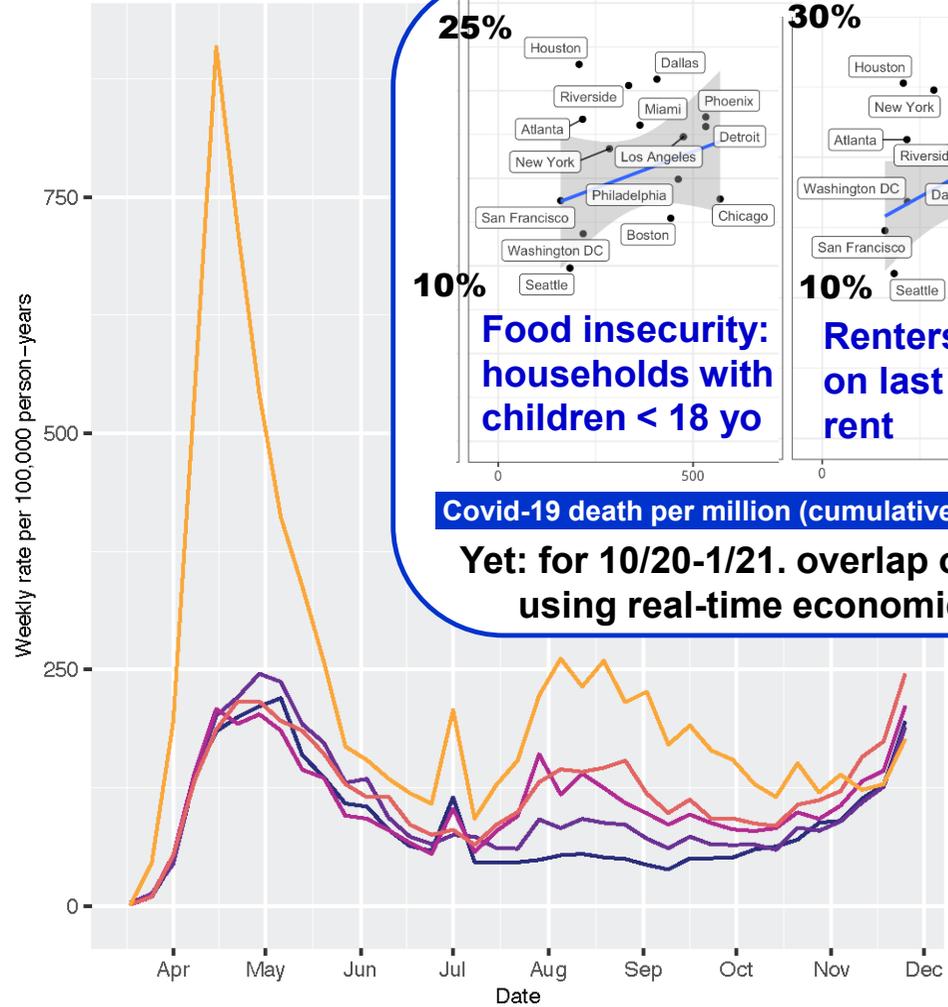
# STATIC SOCIAL DATA IN A *DYNAMIC* PANDEMIC

Weekly COVID-19 case rate per 100,000 person-years  
by county COVID-19 Community Vulnerability Index (CCVI)  
March 11, 2020 - November 25, 2020



county CCVI — [0,0.198] — (0.198,0.392] — (0.392,0.588] — (0.588,0.79] — (0.79,1]  
lowest risk highest risk

Weekly COVID-19 death rate per 100,000 person-years  
by county COVID-19 Community Vulnerability Index (CCVI)  
March 11, 2020 - November 25, 2020



**25%**

**10%**

**Food insecurity:  
households with  
children < 18 yo**

**30%**

**10%**

**Renters behind  
on last month's  
rent**

**Covid-19 death per million (cumulative since 10/1/20)**

Yet: for 10/20-1/21. overlap of misery,  
using real-time economic data

# US Census Household Pulse Survey: US (50 states + District of Columbia)

Oct 28, 2020 – Jan 18, 2021	Food insecurity		Housing insecurity	
Racialized Group	< 4 yrs college	4+ yrs college	< 4 yrs college	4+ yrs college
White alone, not Hispanic (NH)	15.7%	3.0%	15.9%	5.1%
Black alone, NH	29.2%	11.5%	31.6%	18.2%
Hispanic or Latino	26.2%	8.4%	23.8%	13.9%
Asian alone, NH	15.8%	4.4%	19.5%	15.2%
2+ races + Other races, NH	26.7%	9.3%	24.4%	9.8%