



Northwestern  
University

# Introduction to Data Visualization & Data Storytelling

## Week 8



# Recap

# Assignment #5



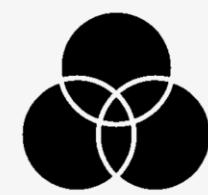
# Spotlight

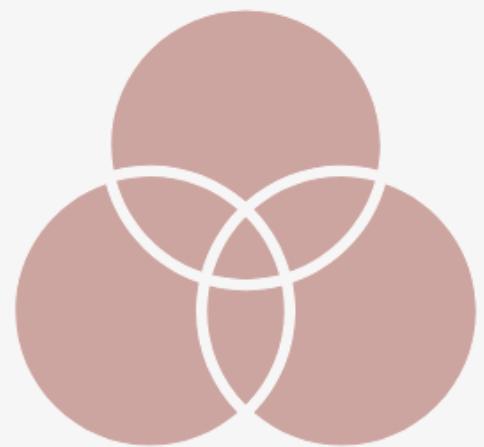


# Kat Greenbrook

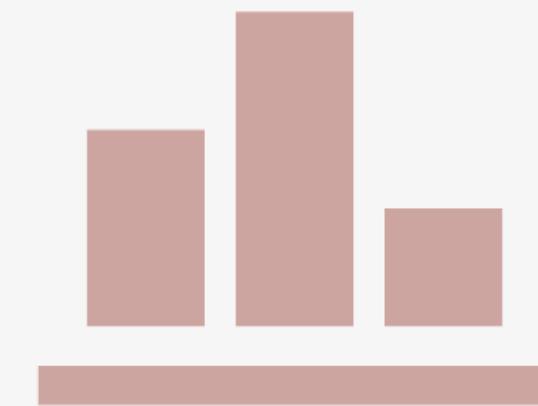


# Exploring Different Chart Types

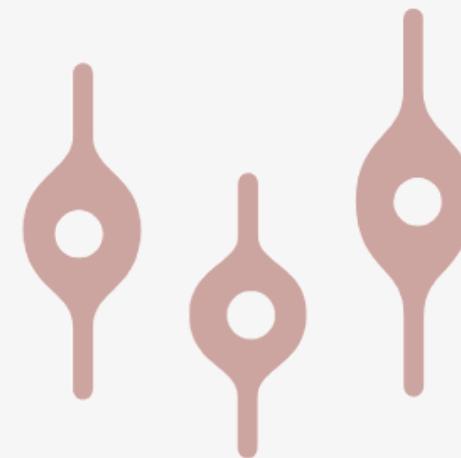




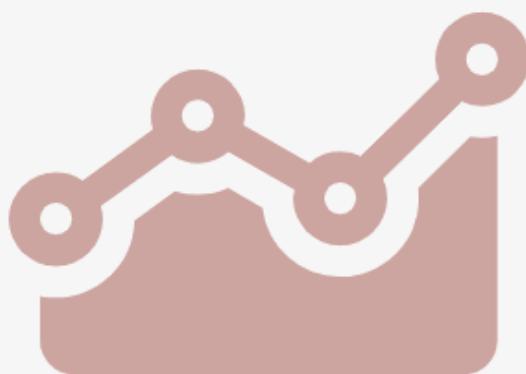
RELATIONSHIP



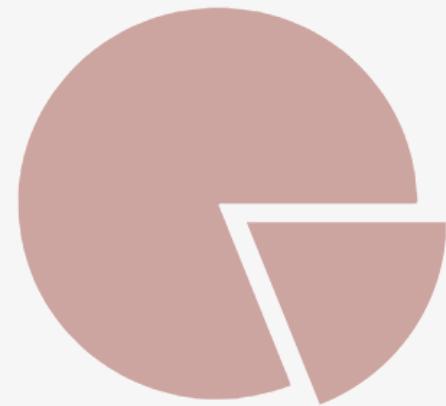
COMPARING CATEGORIES



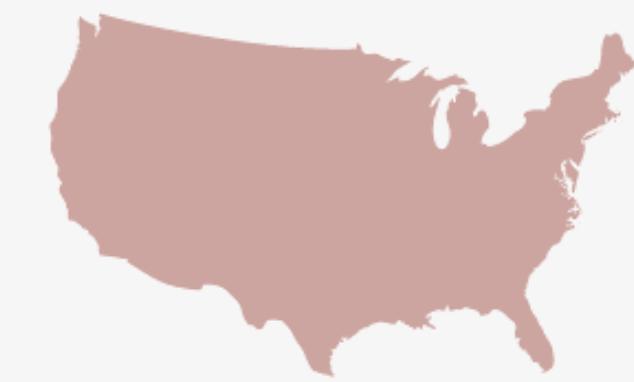
DISTRIBUTION



TIME



PART-TO-WHOLE



GEOSPATIAL



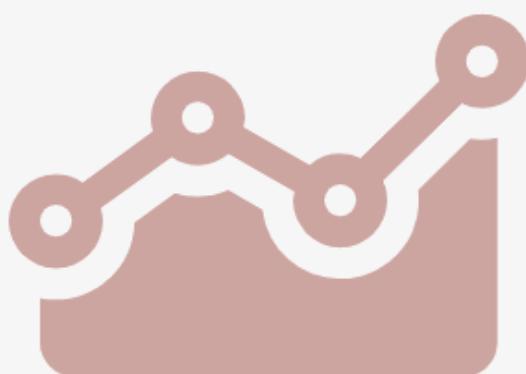
RELATIONSHIP



COMPARING CATEGORIES



DISTRIBUTION



TIME



PART-TO-WHOLE



GEOSPATIAL

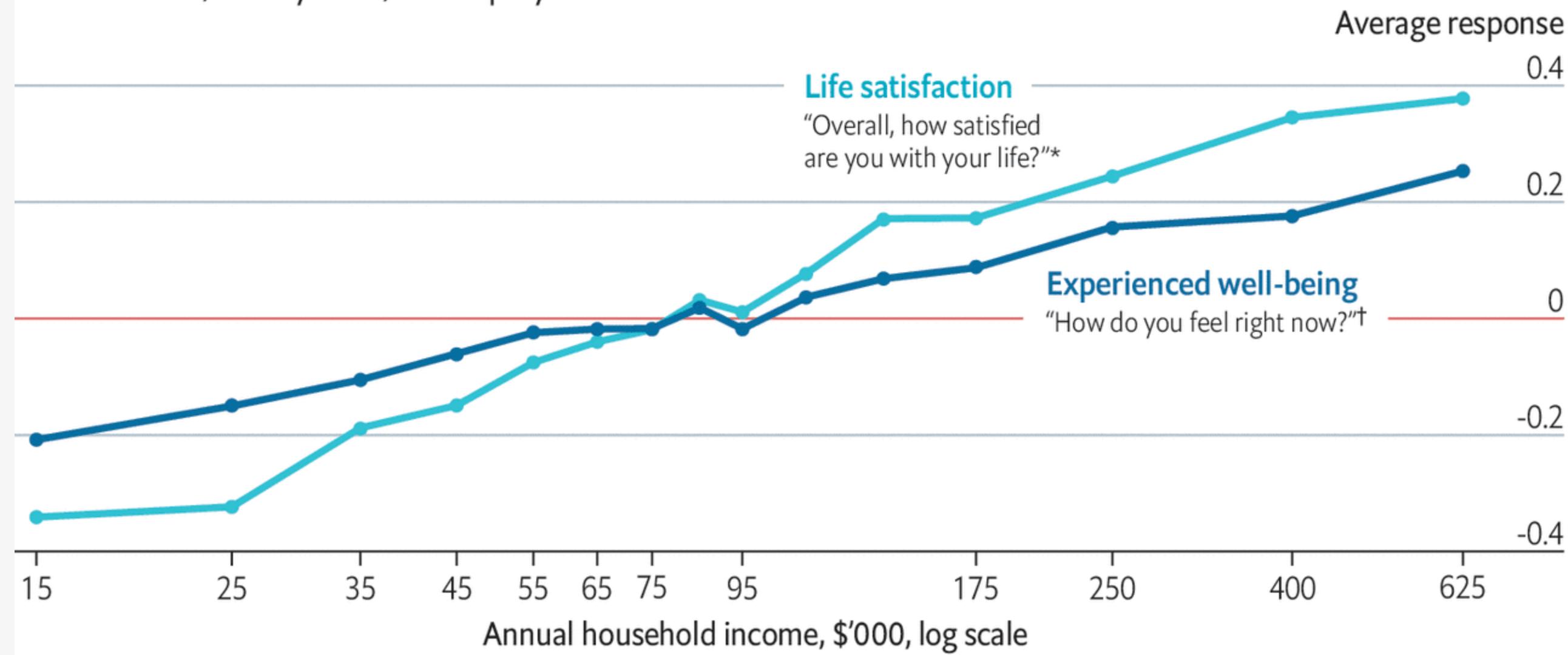


# Line Chart

TIME

## The grinn coefficient

United States, survey of 33,391 employed adults



Source: "Experienced well-being rises with income, even above \$75,000 per year", by Matthew A. Killingsworth, PNAS 2021

\*"Not at all" to "extremely"

†"Very good" to "very bad"

The Economist



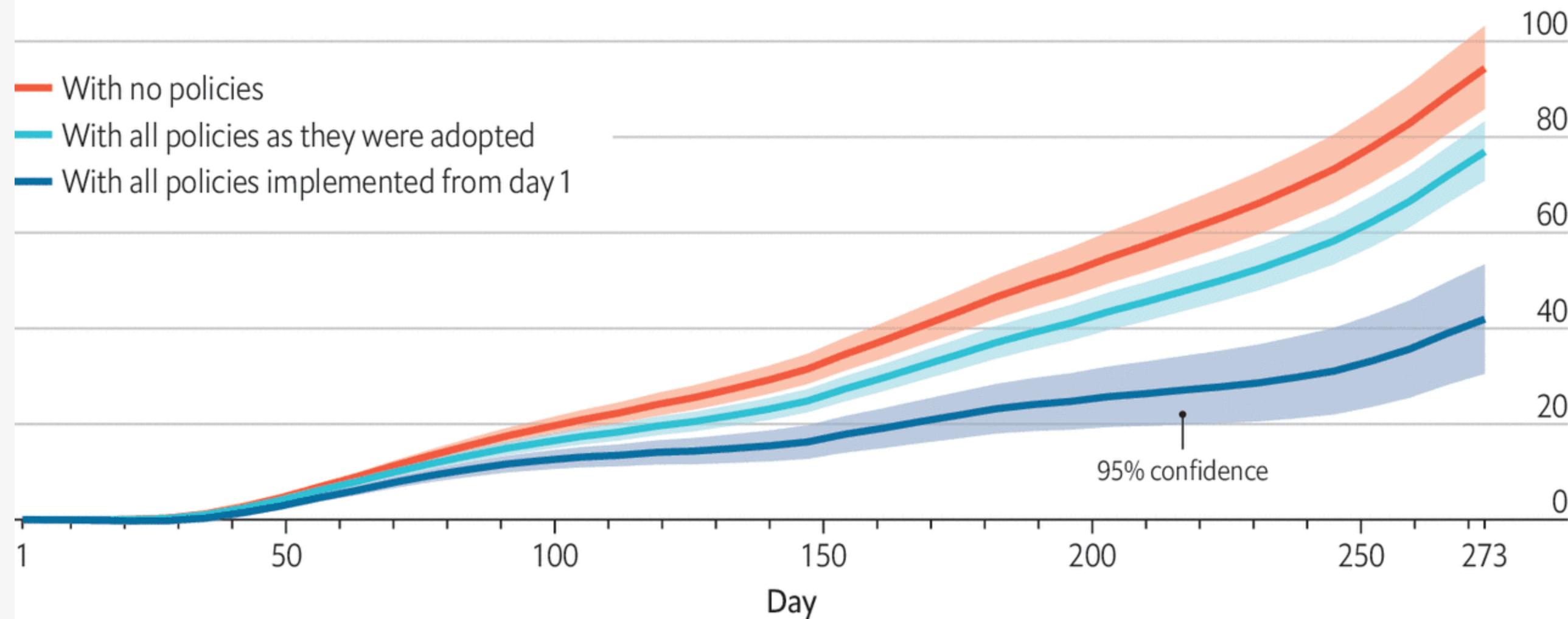
# Line Chart

TIME

## Shelter in place

United States, predicted cumulative covid-19 deaths per 100,000

From a model investigating the impact of housing policies such as eviction bans and guaranteeing utilities



Source: "Housing precarity and the covid-19 pandemic" by K. Jowers et al., 2021, National Bureau of Economic Research (working paper)

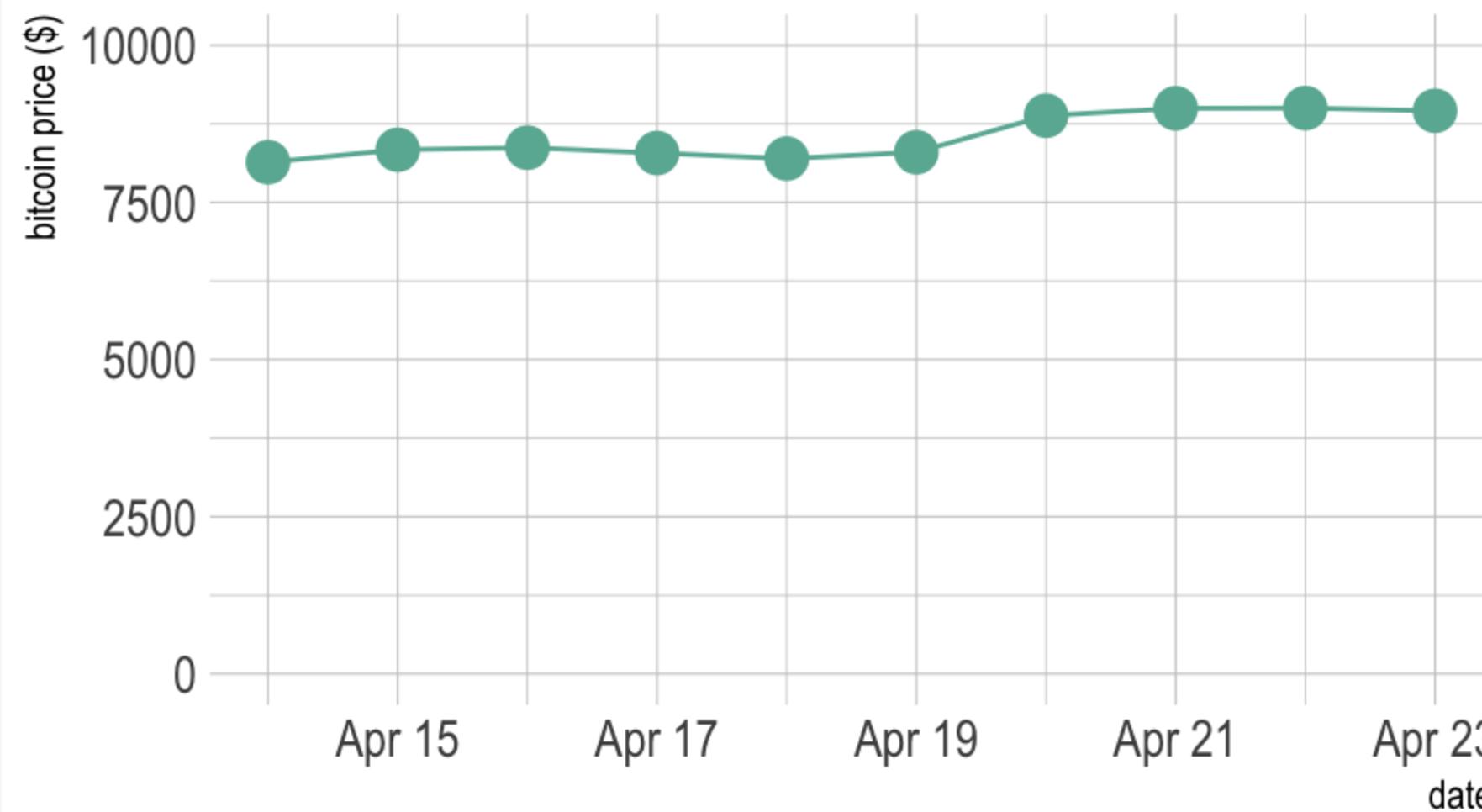
The Economist



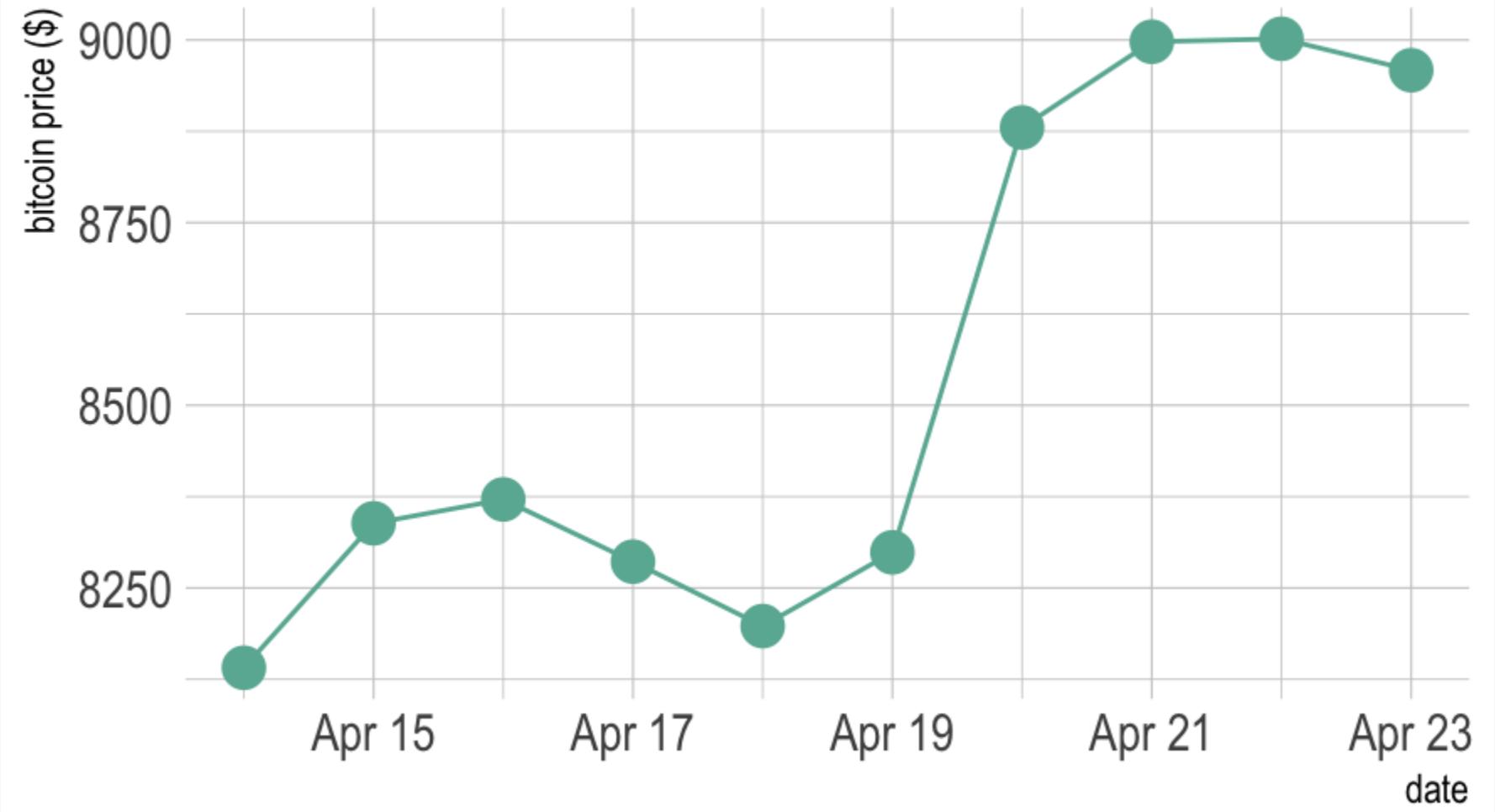
TIME



## Not cutting



## Cutting



Source: <https://www.data-to-viz.com/graph/line.html>

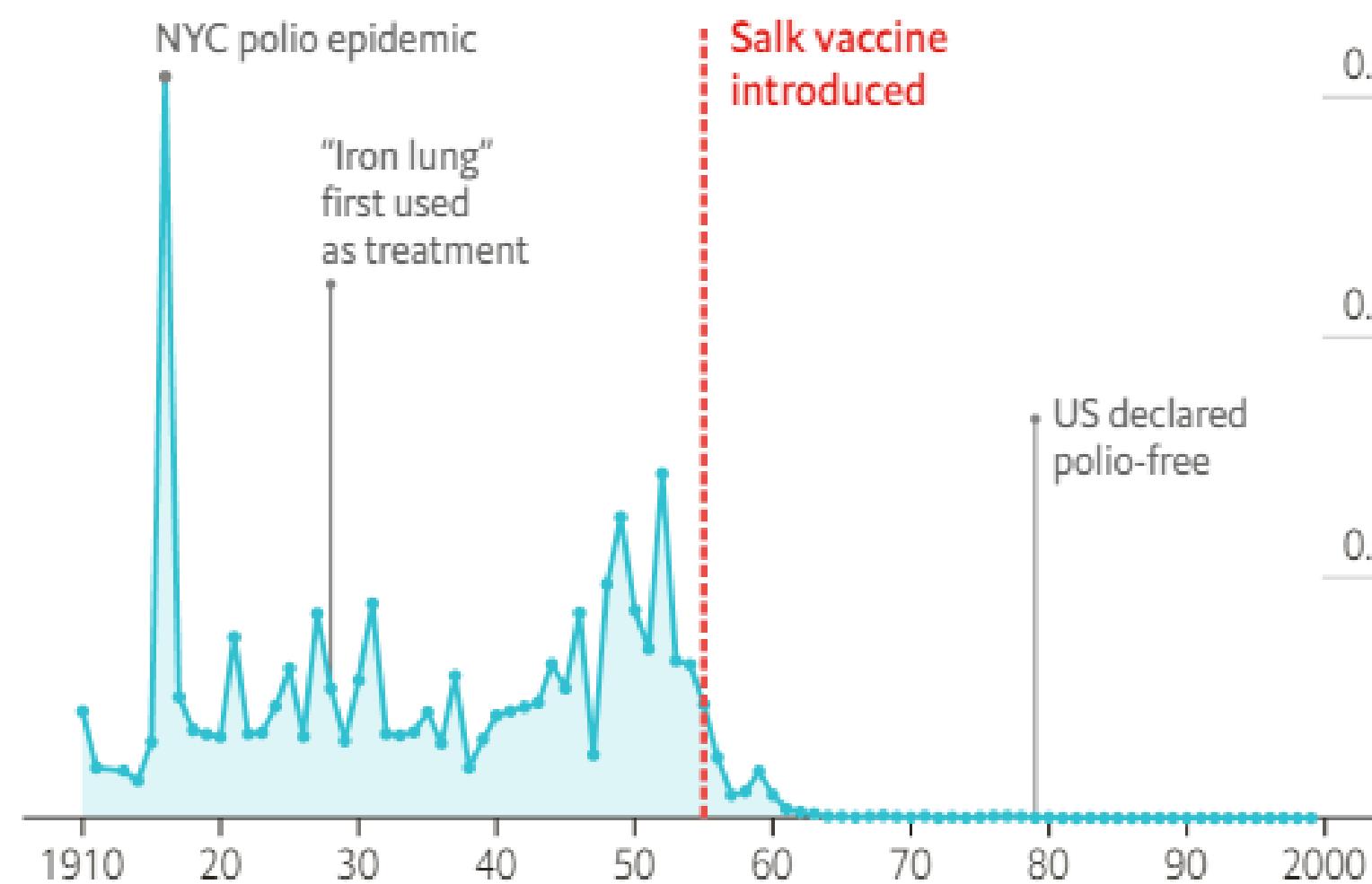


TIME

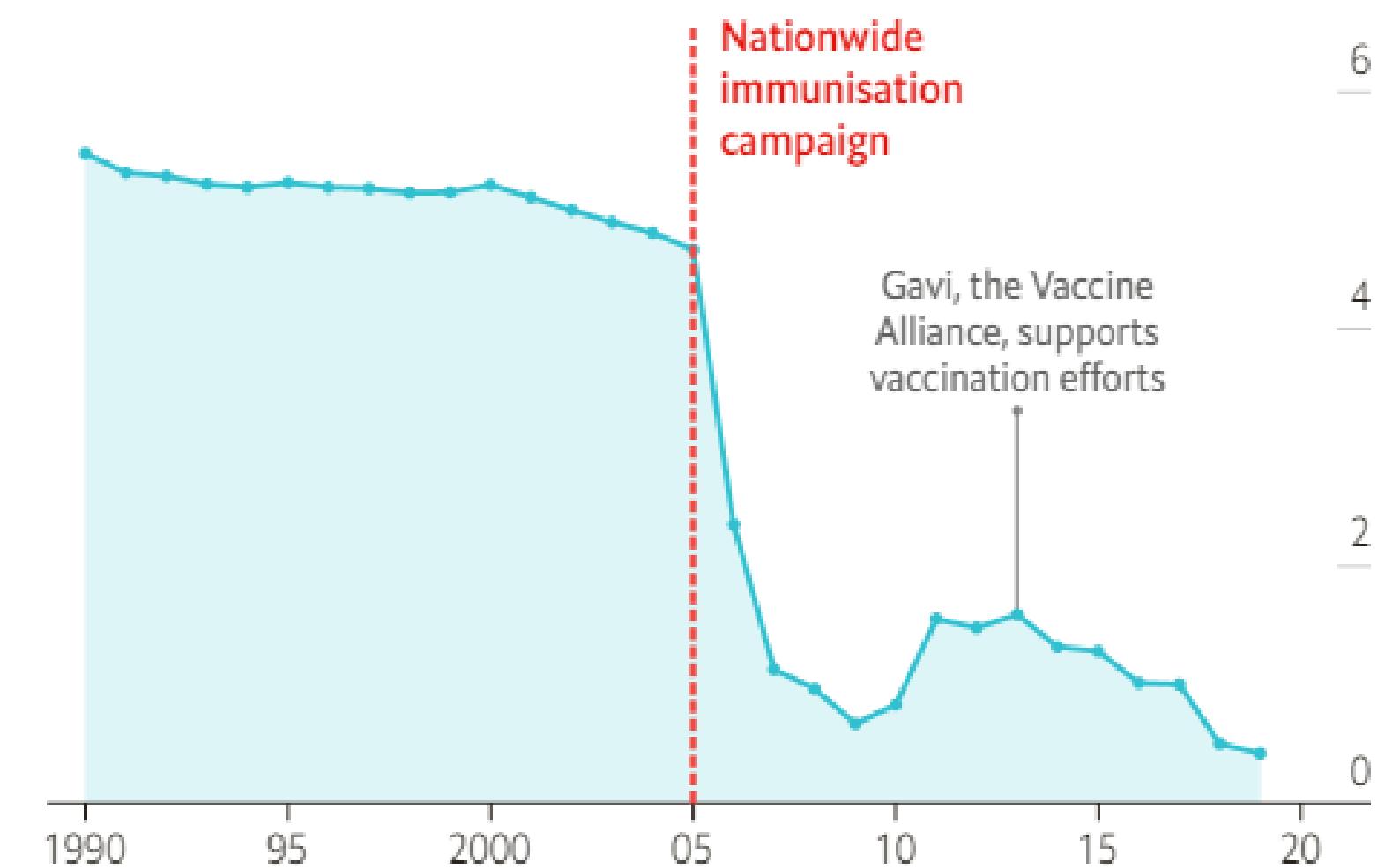
# Area Chart



Polio, United States, % of all deaths



Measles, Nigeria, % of all deaths



Source: <https://www.economist.com/graphic-detail/2021/01/23/the-smallpox-vaccine-took-decades-to-bear-fruit>



# Stacked Area Chart

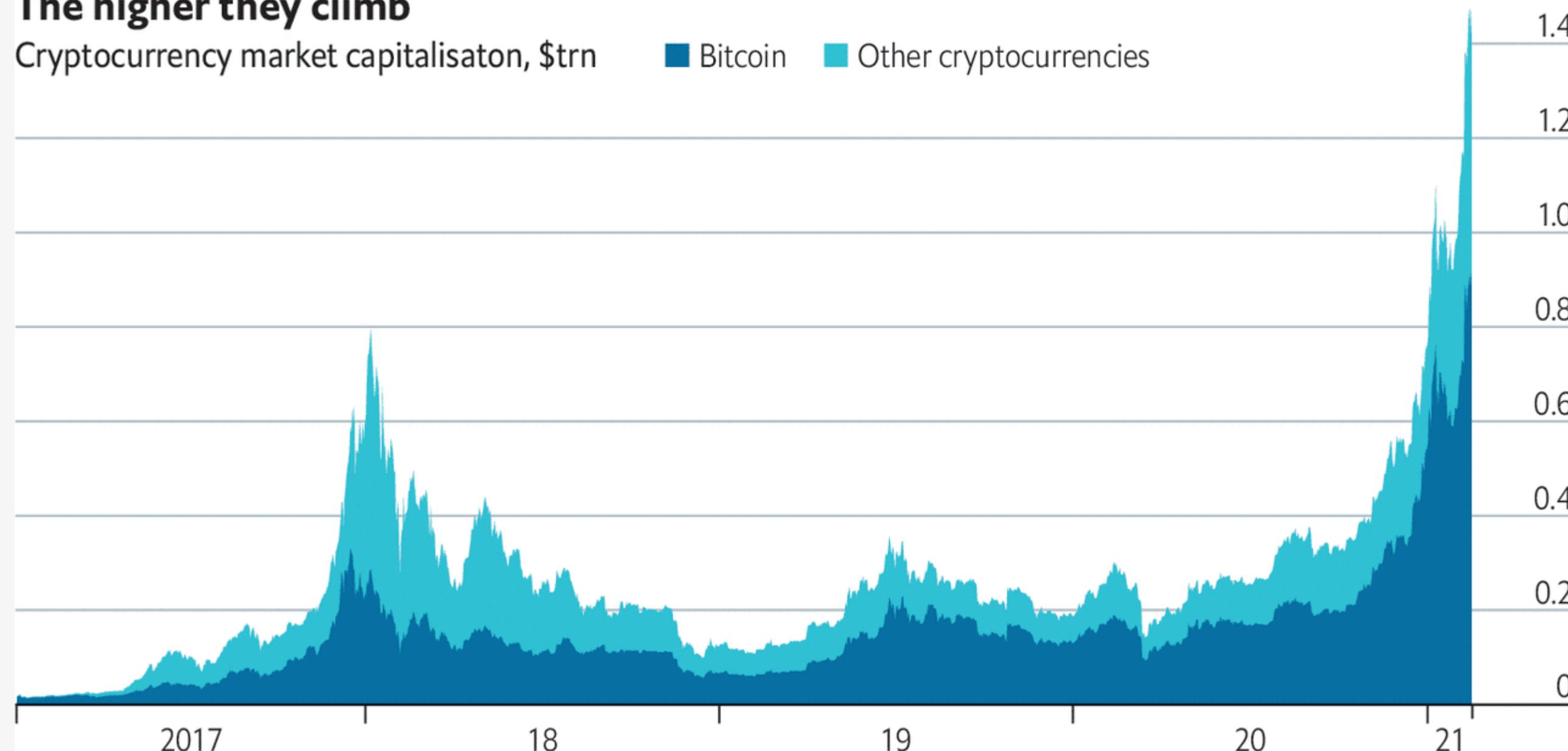
TIME

## The higher they climb

Cryptocurrency market capitalisation, \$trn

Bitcoin

Other cryptocurrencies



Source: Coin Dance

The Economist

Source: <https://www.economist.com/graphic-detail/2021/02/16/bitcoin-hits-50000-for-first-time>



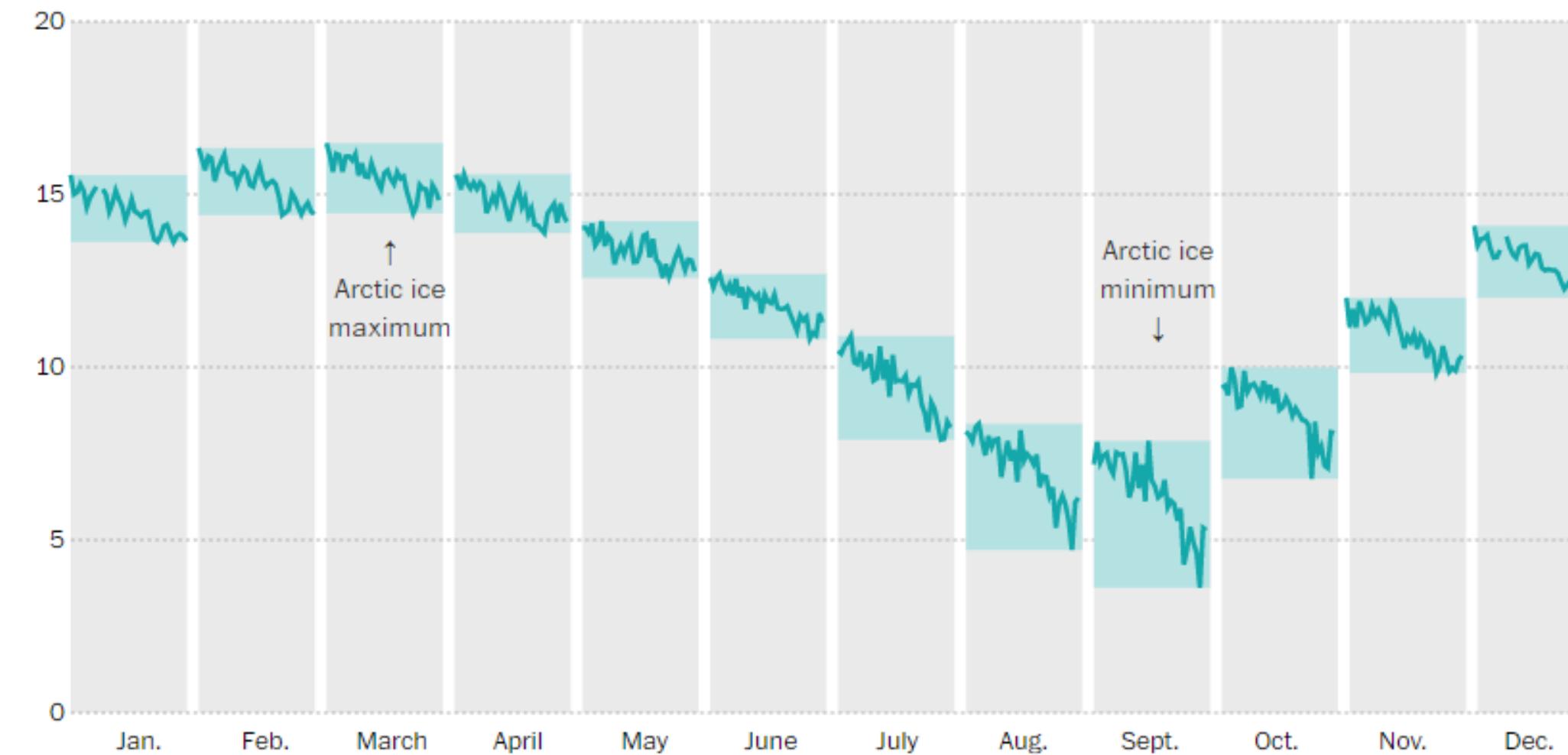
TIME

# Cycle Graph



## Monthly levels of ice extent, 1979 to 2015, in millions of square kilometers

Arctic sea-ice extent has experienced an unmistakable downward trend in every single month since 1979.



Source: <https://www.washingtonpost.com/graphics/national/arctic-ice-2015/>

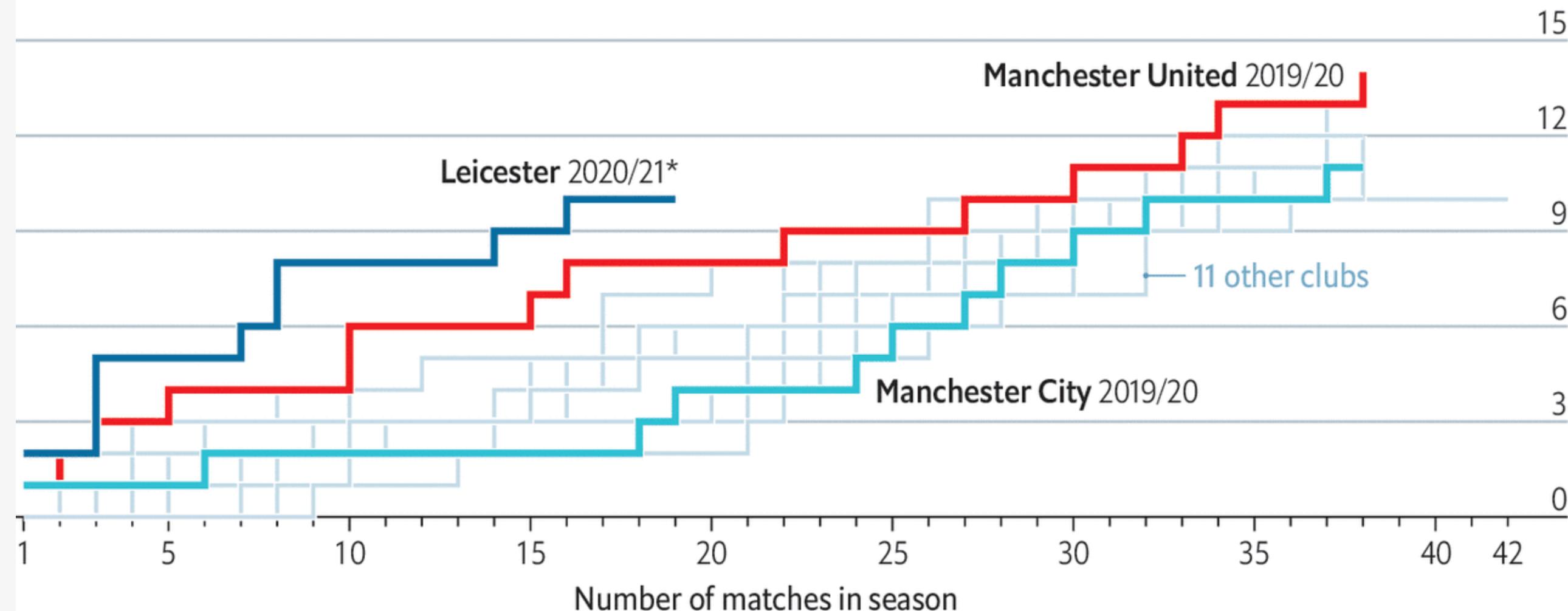


# Step Chart

TIME

## Kicking up a fuss

English Premier League, number of penalties awarded  
Clubs with the most penalties, 1992/93-2020/21



Source: Transfermarkt

\*At January 29th 2021

The Economist



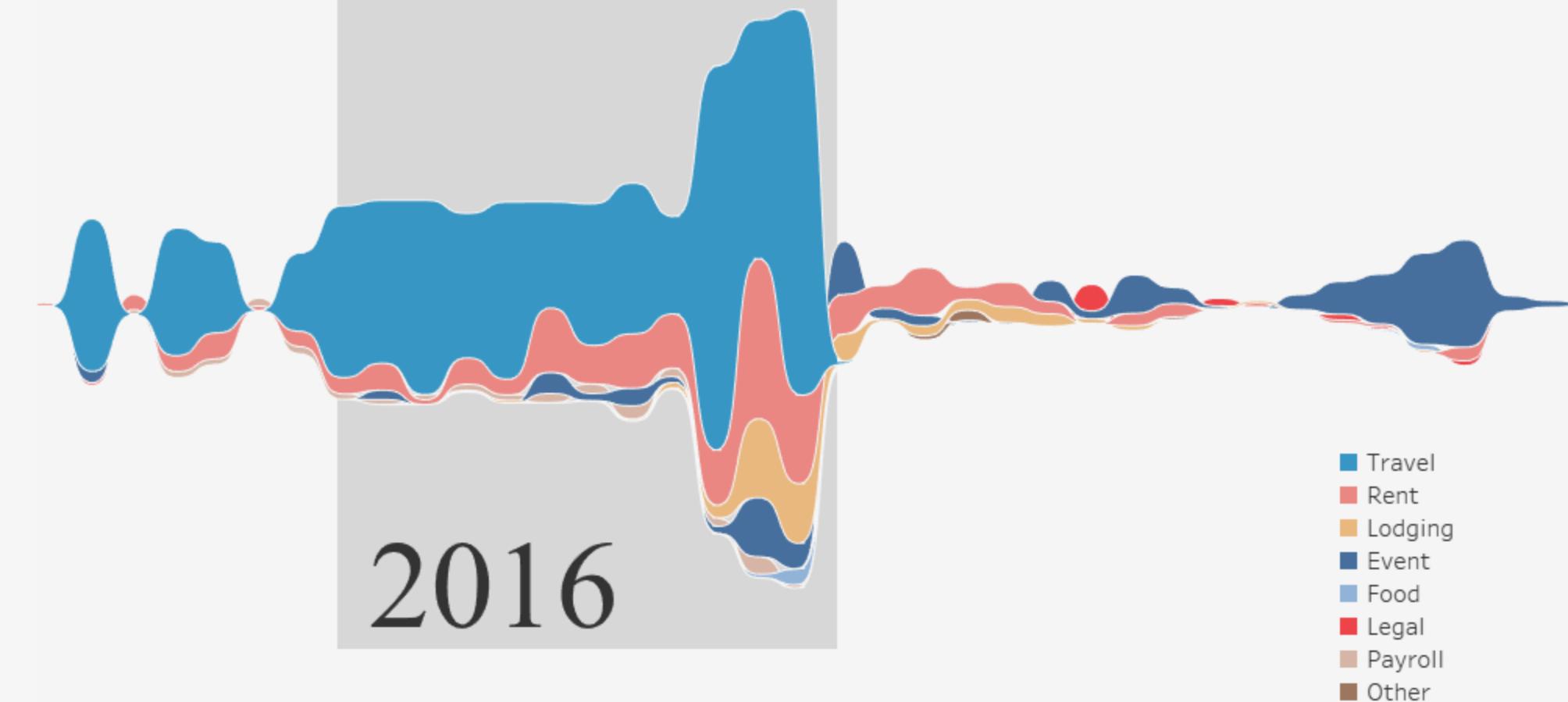
TIME

# Steamgraph



## PAYING THE PRESIDENT

All campaigns and agencies expenses since 2015



DATA SOURCE: ProPublica

design : @ltavernier7

Source: <https://greatified.com/2018/09/17/how-to-build-a-stream-graph-in-tableau-software/>



# Joy (Ridgeline) Plot

TIME

## Peak time of day for sports and leisure

Number of participants throughout the day compared to peak popularity.  
Note the morning-and-evening everyday workouts, the midday hobbies,  
and the evenings/late nights out.



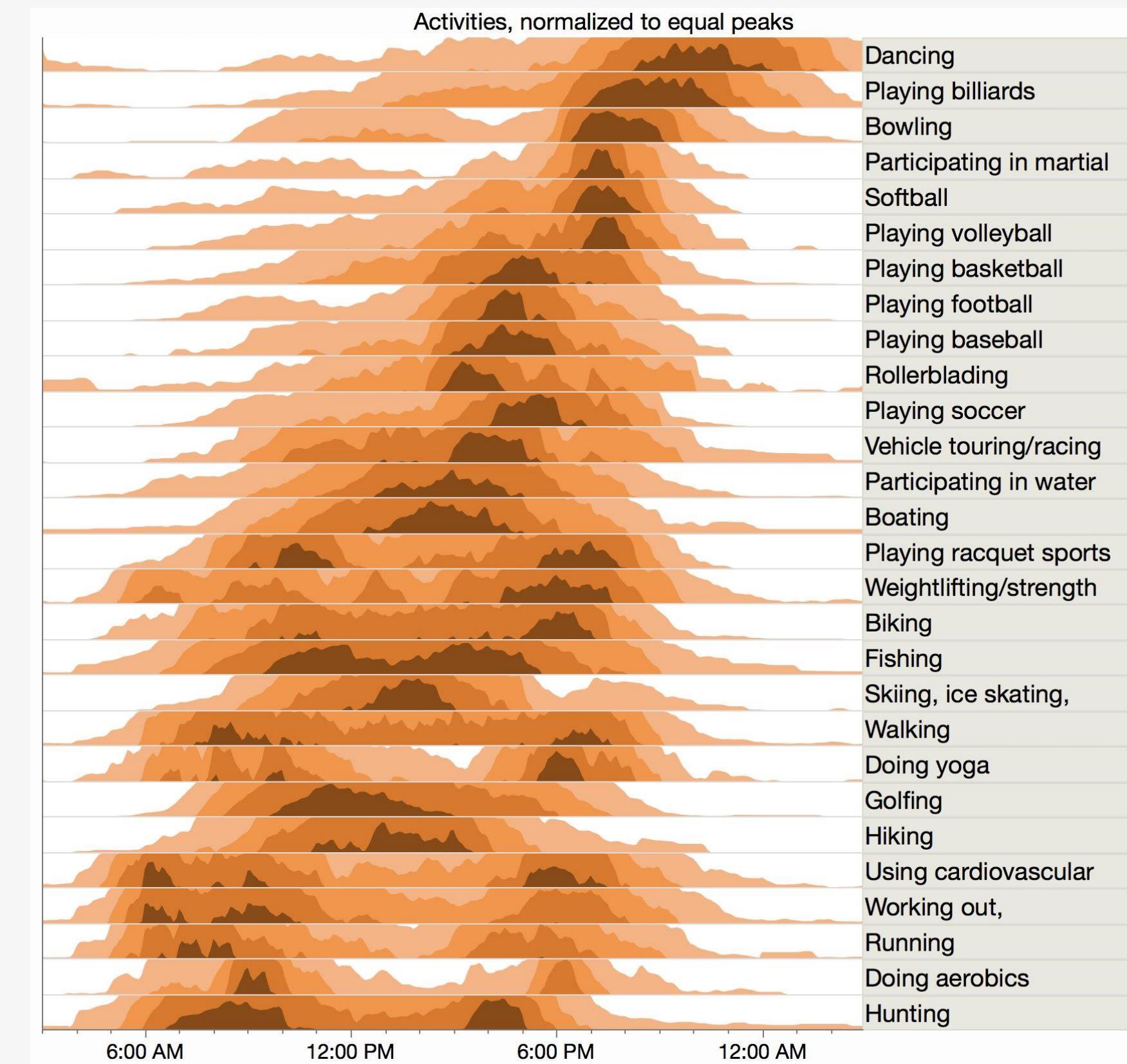
@hnrlndbрг | Source: American Time Use Survey

Source: <https://eagereyes.org/blog/2017/joy-plots>



# Horizon Chart

TIME



Source: <https://twitter.com/xangregg/status/883763762381152256/photo/1>



RELATIONSHIP



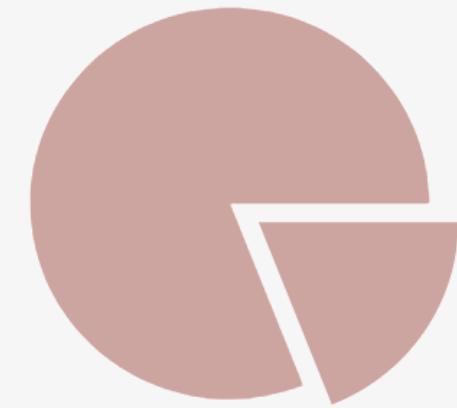
COMPARING CATEGORIES



DISTRIBUTION



TIME



PART-TO-WHOLE



GEOSPATIAL



# Pie Chart

PART-TO-WHOLE

## Why we're losing deals

% of total deals lost (204)  
from mmyy-mmyy



60% of deals were lost because we didn't qualify appropriately or timing was outside of the customers' budgeting cycle.

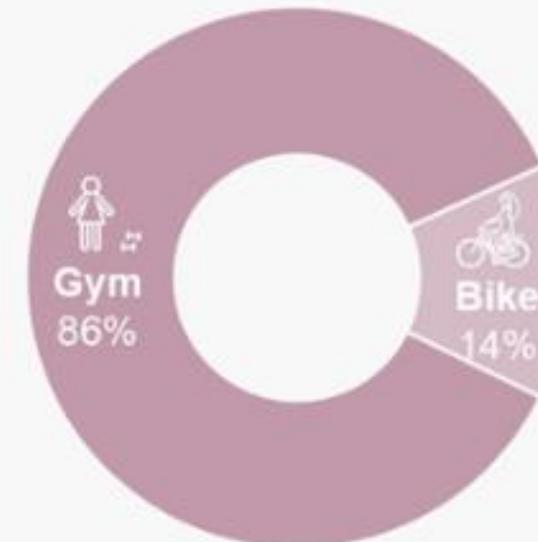
How might we improve our process?

Source: <http://www.storytellingwithdata.com/blog/2020/2/26/how-to-make-a-better-pie-chart>

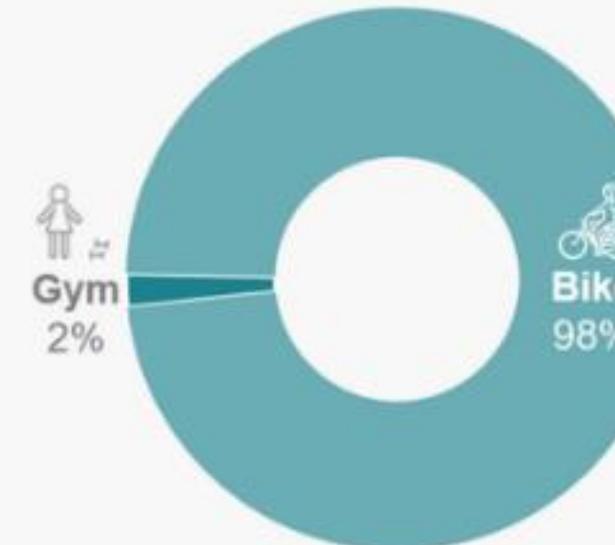


# Donut Chart

PART-TO-WHOLE



24.5 hours working out a month  
100% = time spent working out



20.5 hours working out a month  
100% = time spent working out

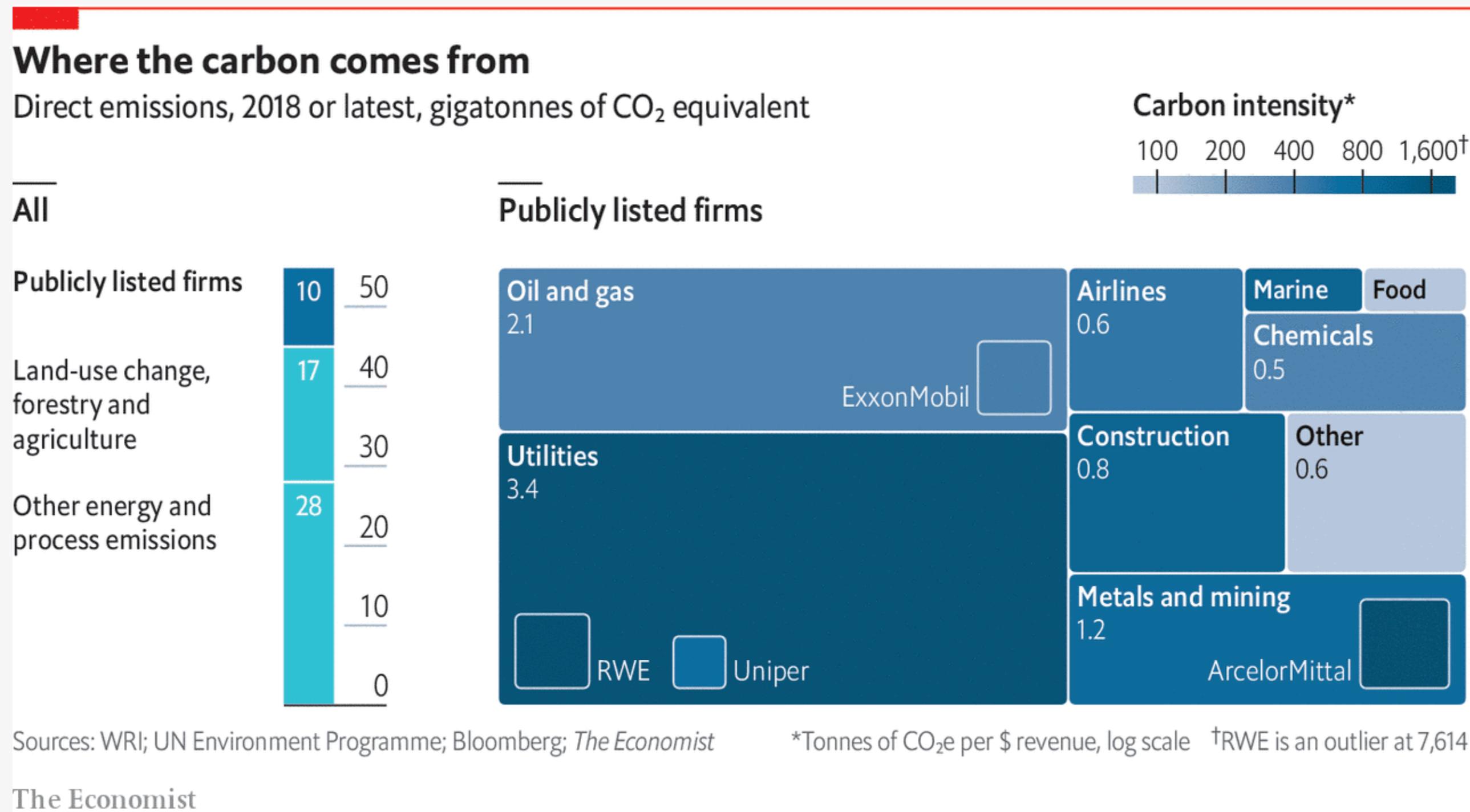
Prior to the pandemic, I used to go to the gym 3-4 times a week and bike every few weeks. After the shelter-in-place orders, I started biking 3-4 times a week and only went to the gym once.

Source: personal data | Design: Rebeca Pop



# Treemap

PART-TO-WHOLE

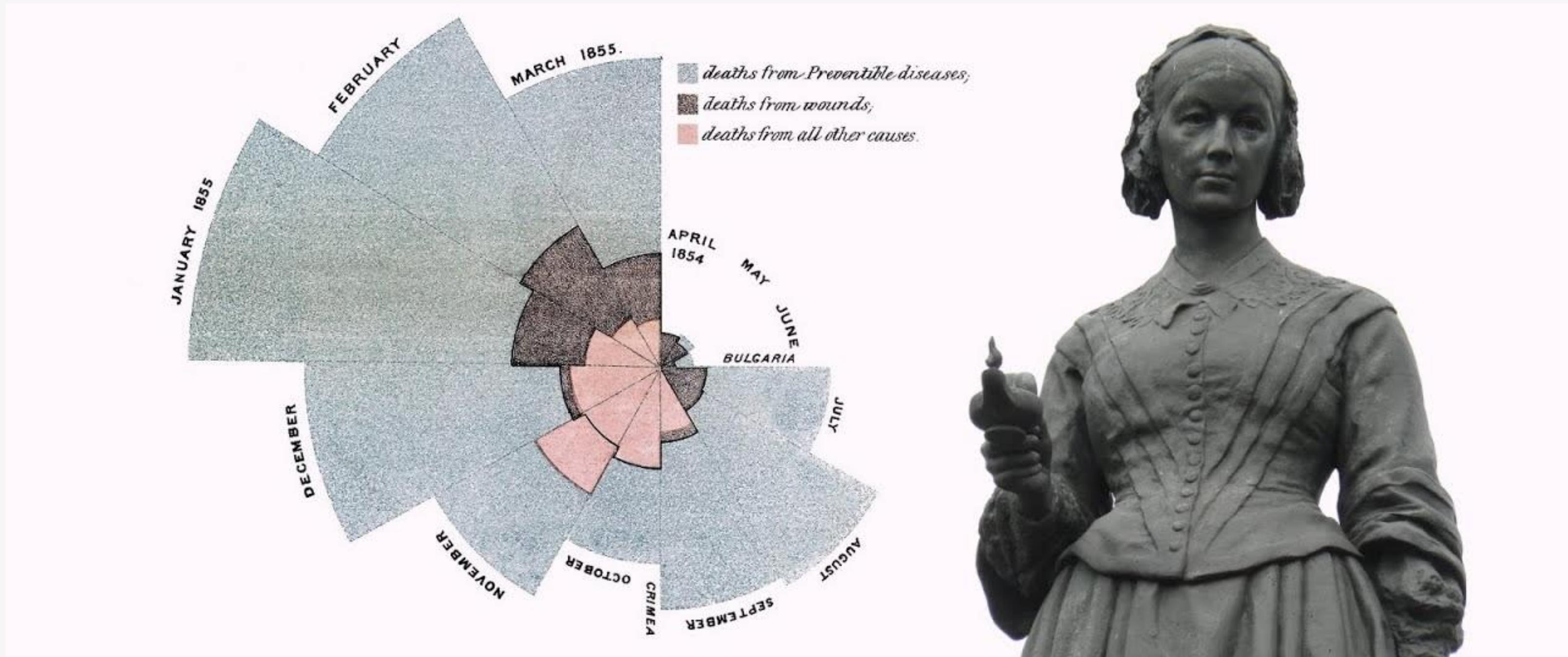


Source: <https://www.economist.com/graphic-detail/2020/06/22/green-investing-is-red-hot-but-its-impact-is-underwhelming>



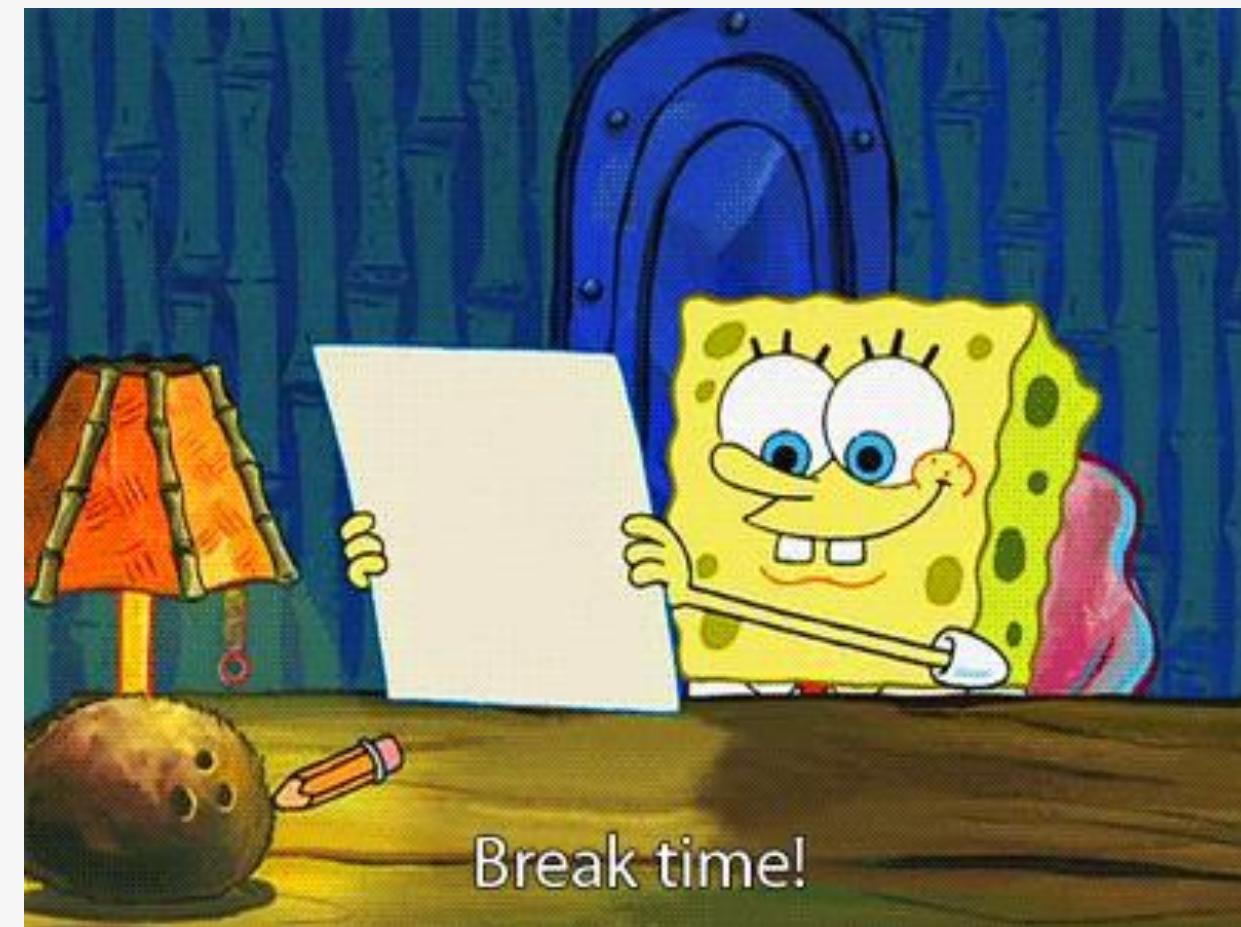
# Nightingale (Coxcomb) Chart

PART-TO-WHOLE



Source: <https://www.youtube.com/watch?app=desktop&v=ILzrYJ3OR7E>

**Break**  
10 minutes





RELATIONSHIP



COMPARING CATEGORIES



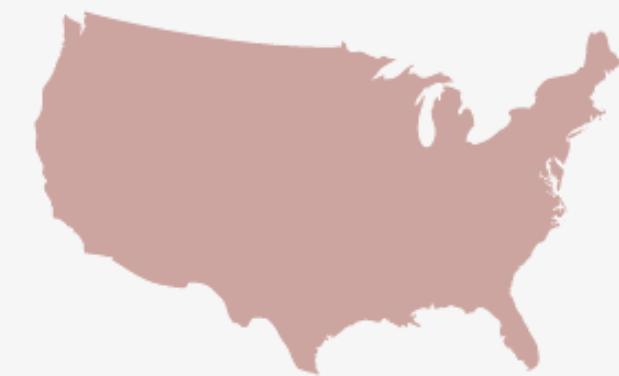
DISTRIBUTION



TIME



PART-TO-WHOLE



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# Choropleth Map

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## Hostile territory

Abortion restrictions in Latin America, 2019 or latest



Source: <https://www.economist.com/graphic-detail/2020/12/30/argentina-legalises-abortion-joining-a-small-latin-american-group>



# Connection Map

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Source: [https://github.com/holtzy/data\\_to\\_viz/blob/master/story/IMG/Surfer\\_travel.png](https://github.com/holtzy/data_to_viz/blob/master/story/IMG/Surfer_travel.png)

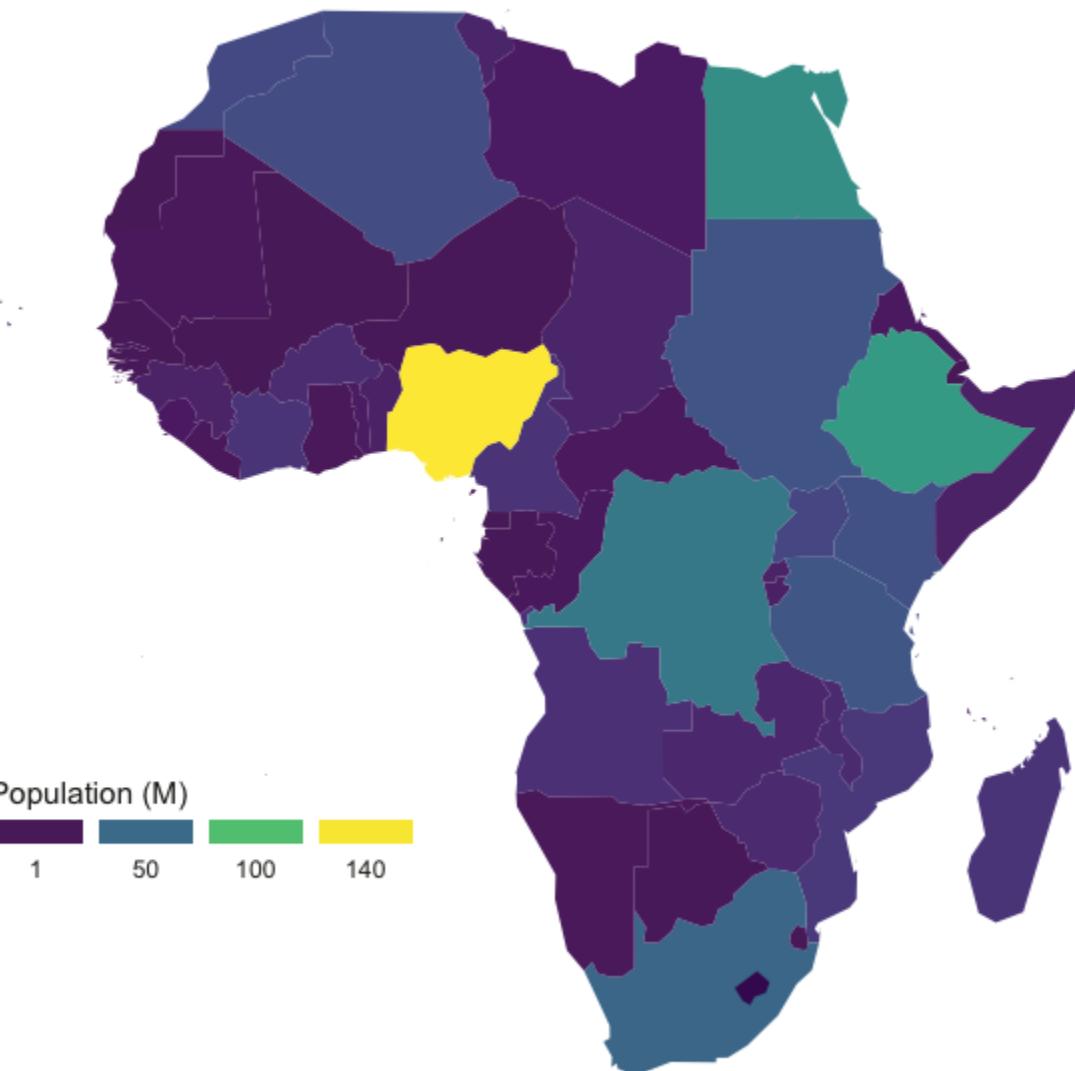


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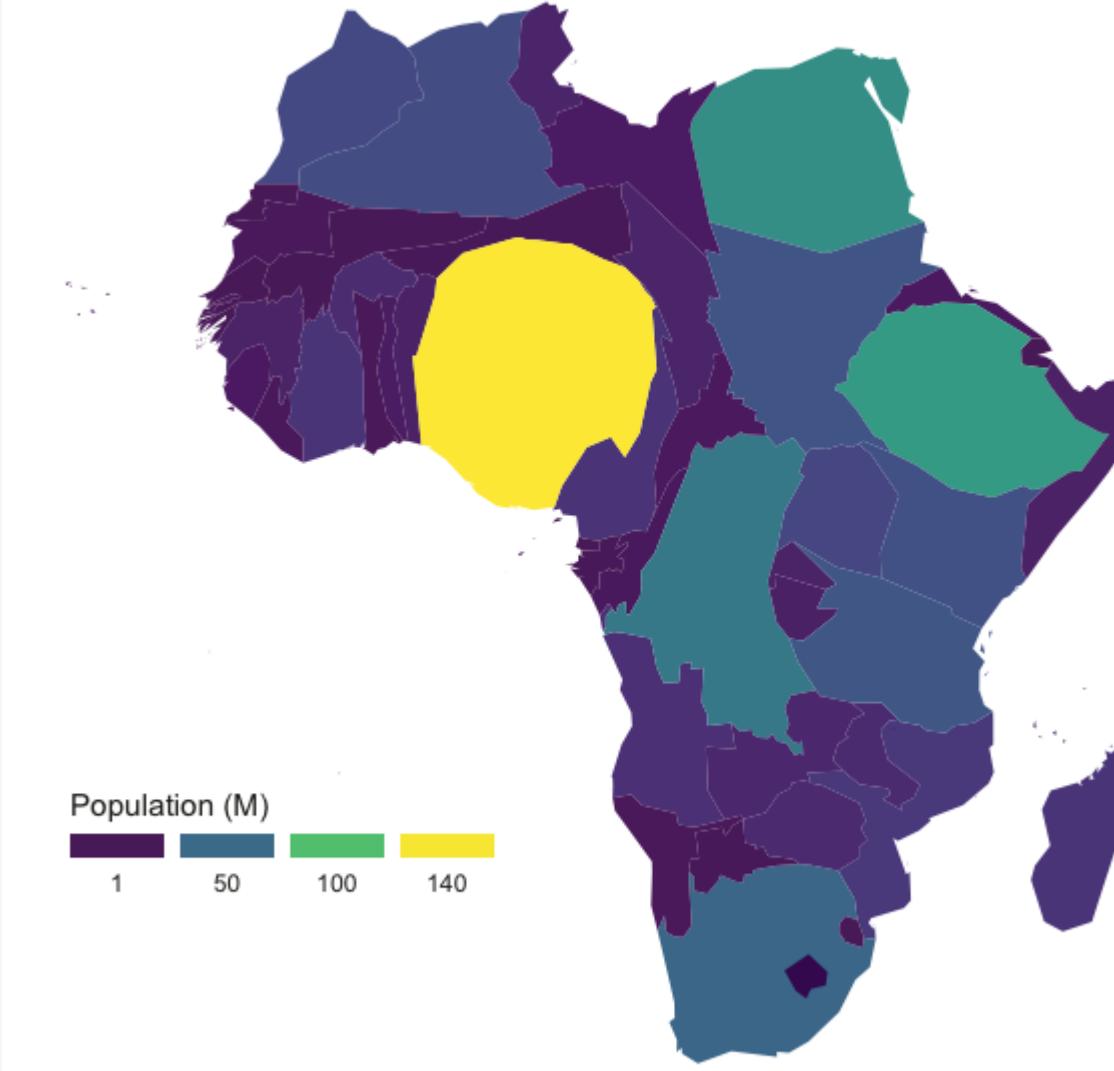


# Cartogram + Choropleth

Real boundaries



Cartogram

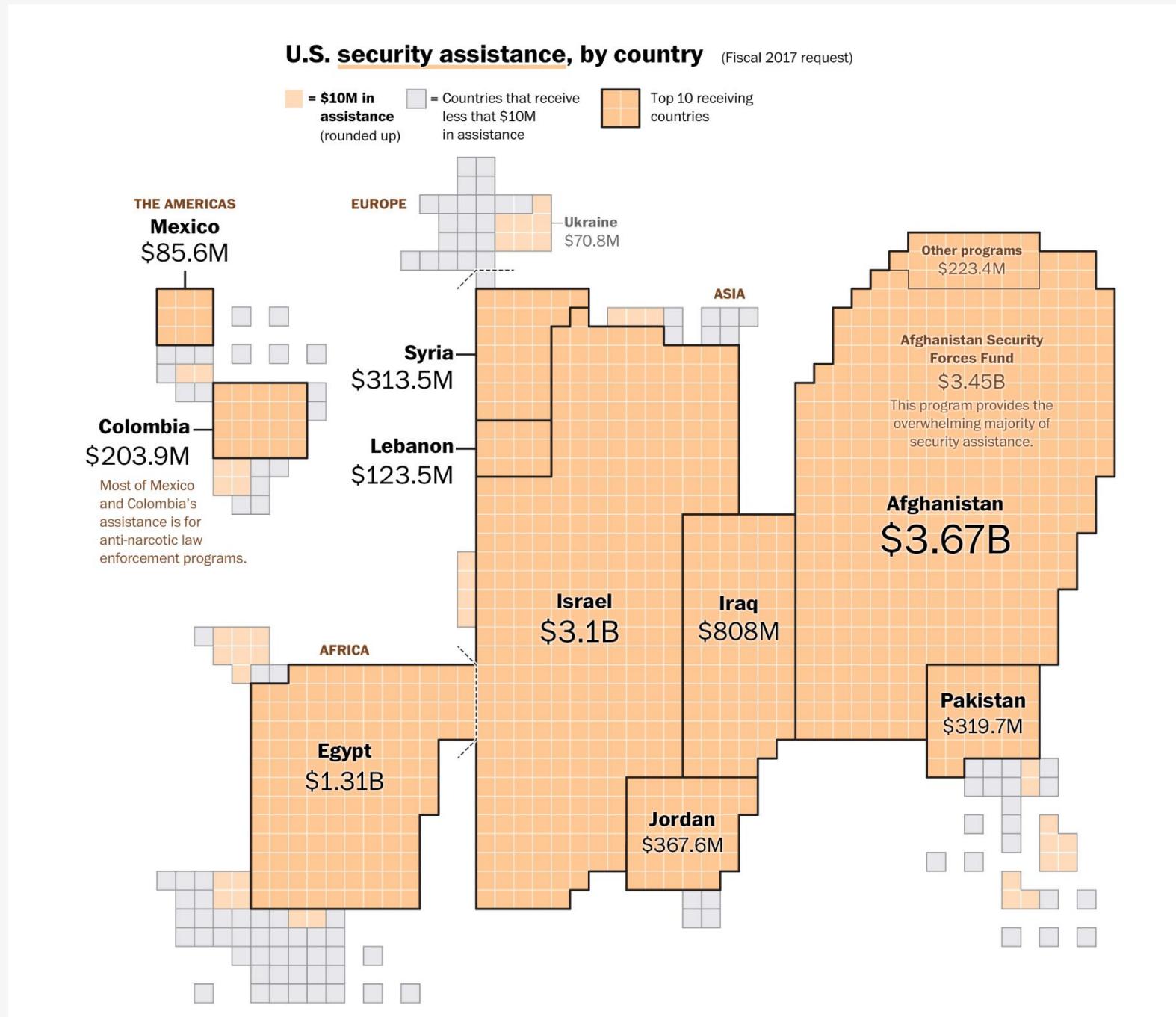


Source: <https://www.data-to-viz.com/graph/cartogram.html>

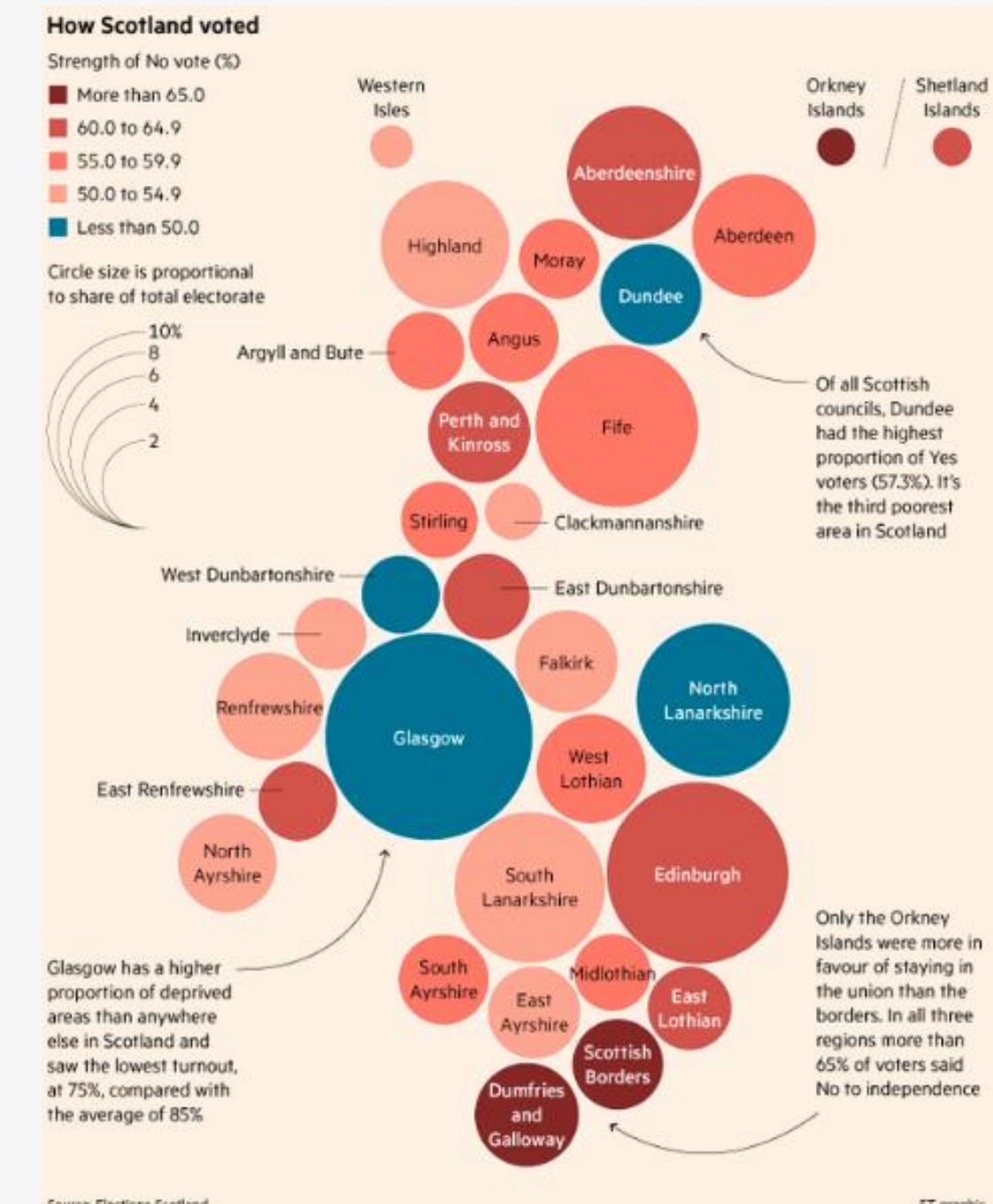


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# Mosaic Cartogram



# Bubble Cartogram



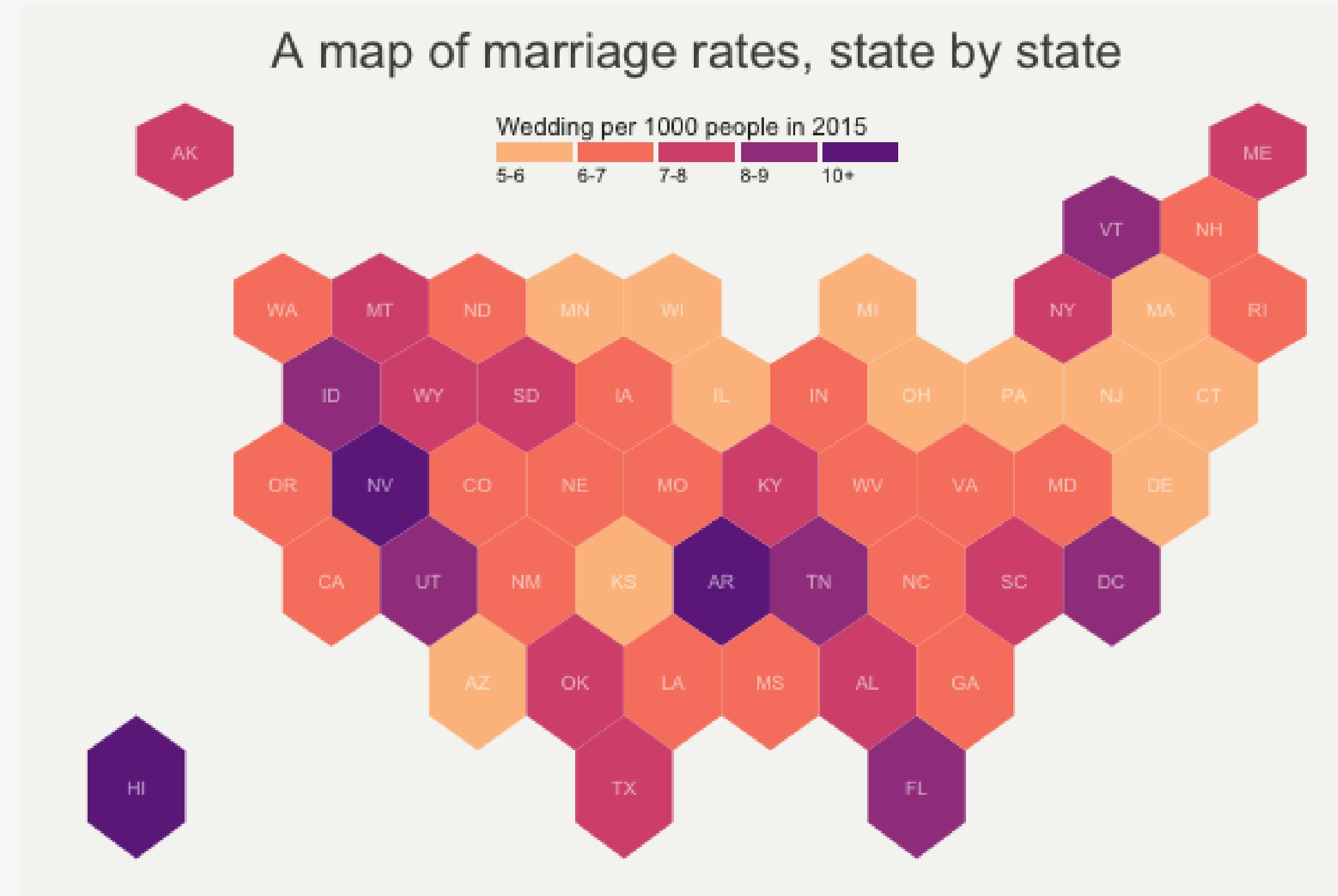
Source: <https://datavizproject.com/wp-content/uploads/2016/01/Sk%C3%A6rbilledede-2017-10-20-kl.-16.27.33.png>

Source: <https://datavizproject.com/wp-content/uploads/2016/01/Sk%C3%A6rbilledede-2016-01-25-kl.-23.49.18.png>



# Hexbin Map

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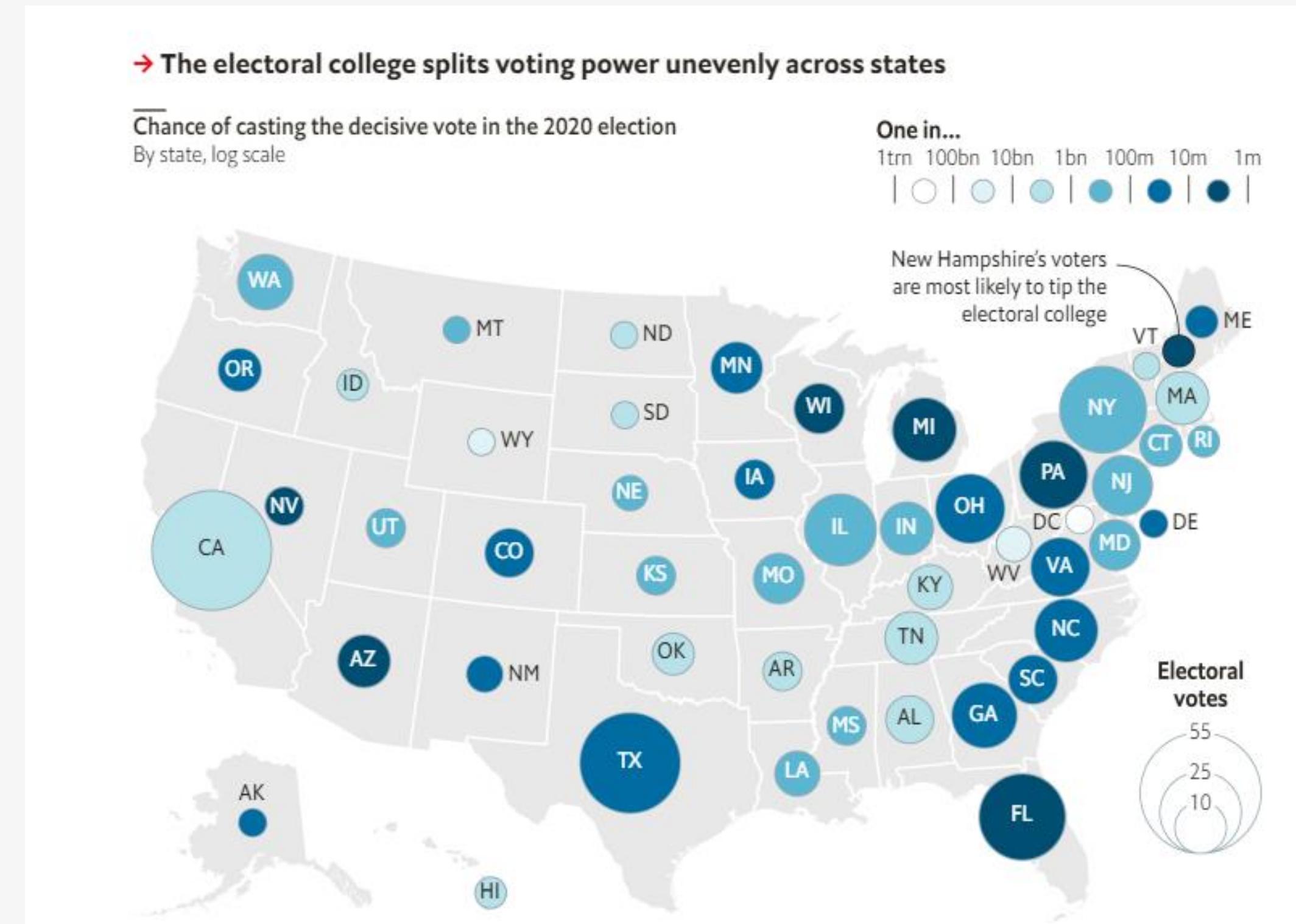
Source: <https://www.r-graph-gallery.com/hexbin-map.html>



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# Bubble (Proportional Symbol) Map



Source: <https://www.economist.com/graphic-detail/2020/08/15/how-americas-electoral-college-favours-white-voters>

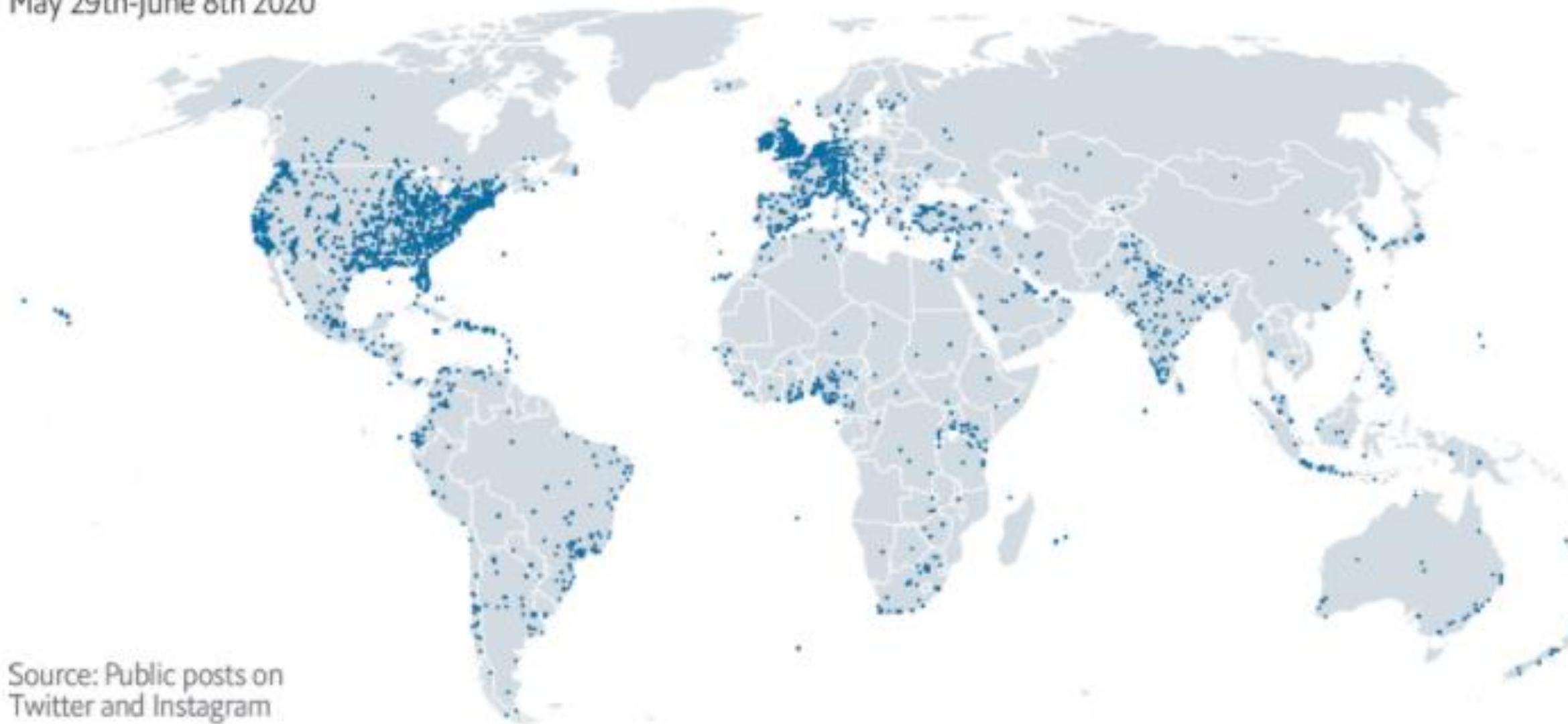


# Dot Density

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## A person who mattered

Twitter and Instagram posts tagged [#georgefloyd](#)  
May 29th-June 8th 2020



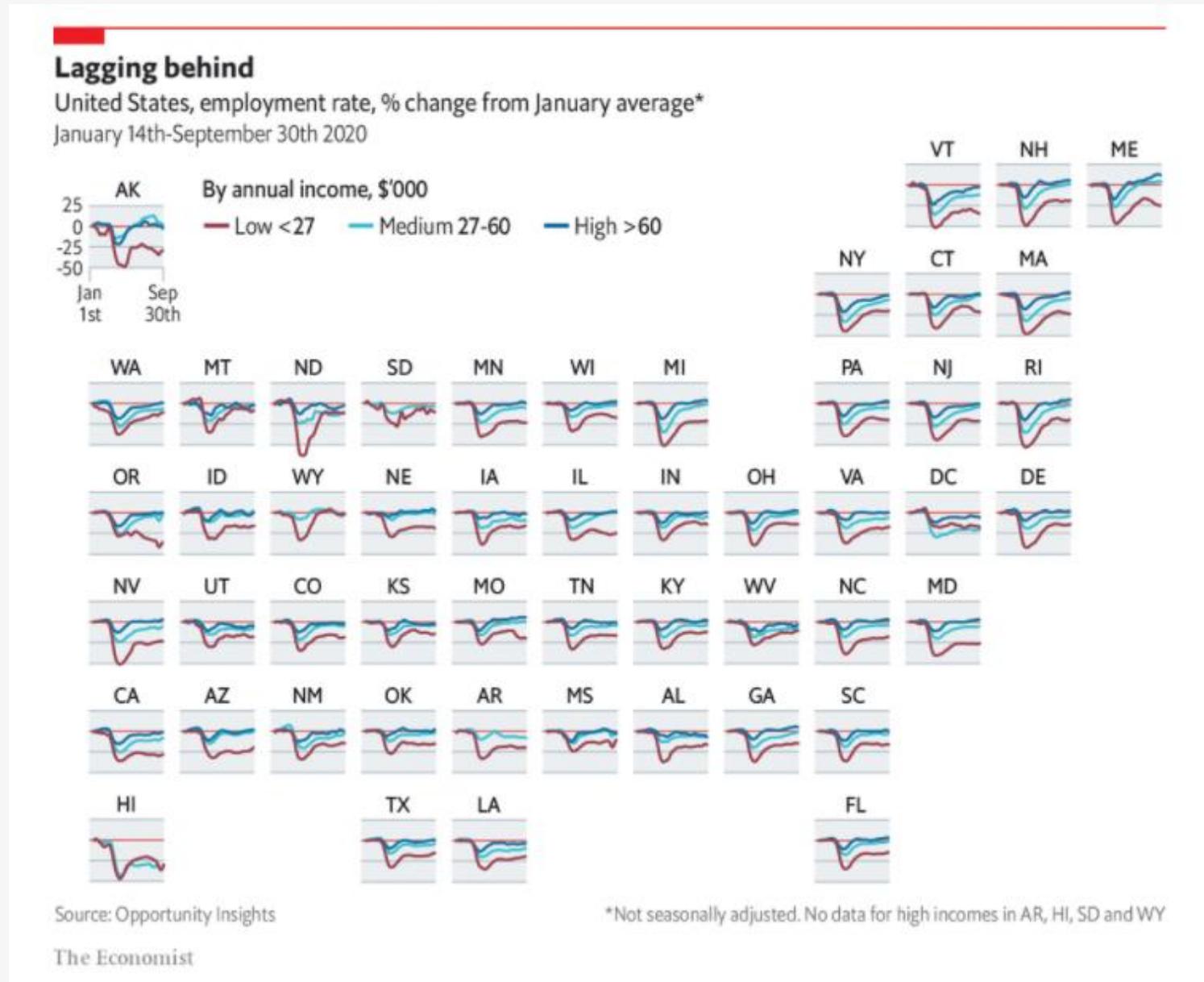
The Economist

Source: <https://www.economist.com/graphic-detail/2020/06/09/george-floyd-is-remembered-around-the-world>

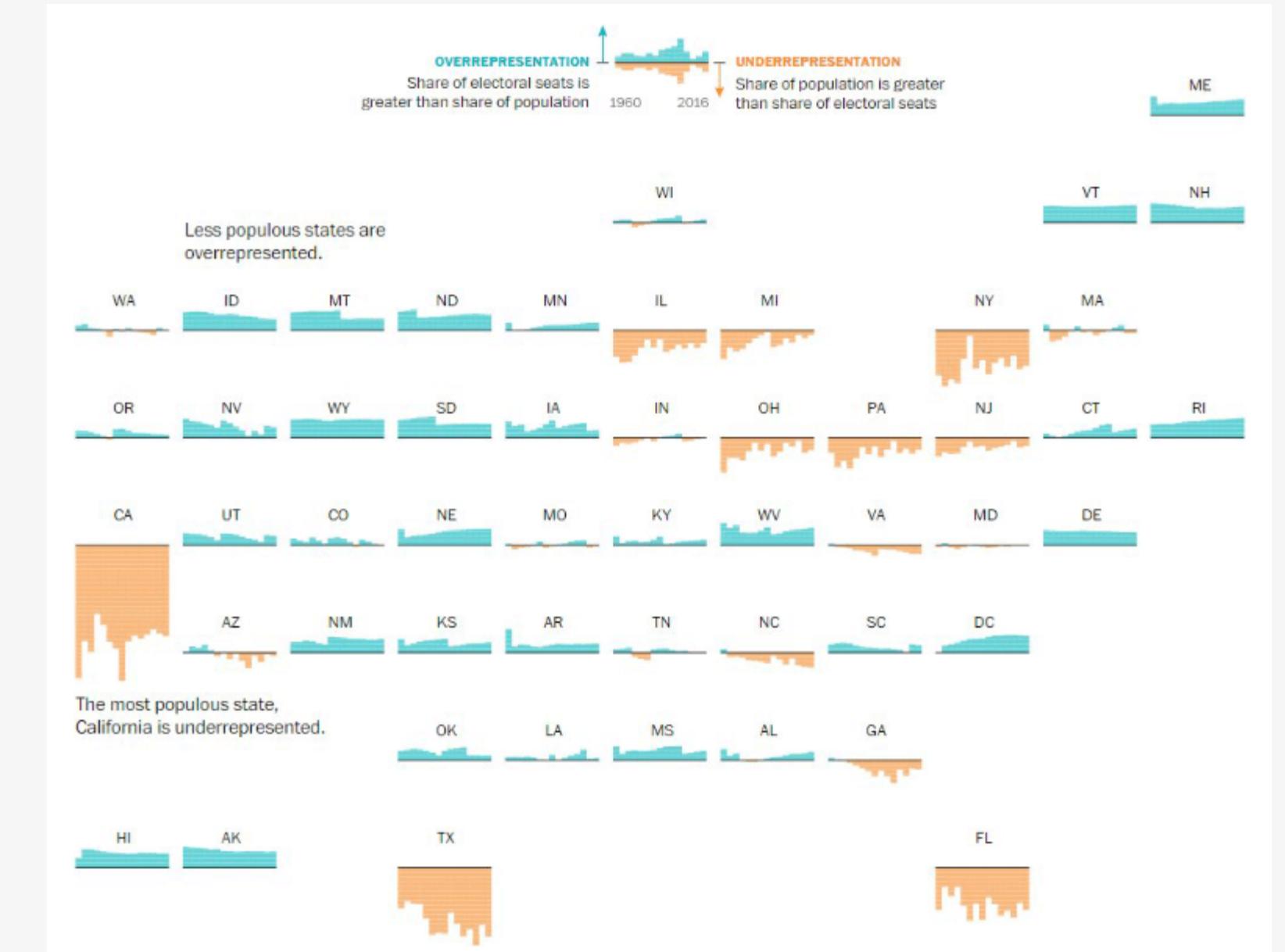


# Tile Grid Map

## GEOSPATIAL



Source: <https://www.economist.com/graphic-detail/2020/12/01/the-recovery-of-low-wage-jobs-in-america-from-covid-19-has-halted>

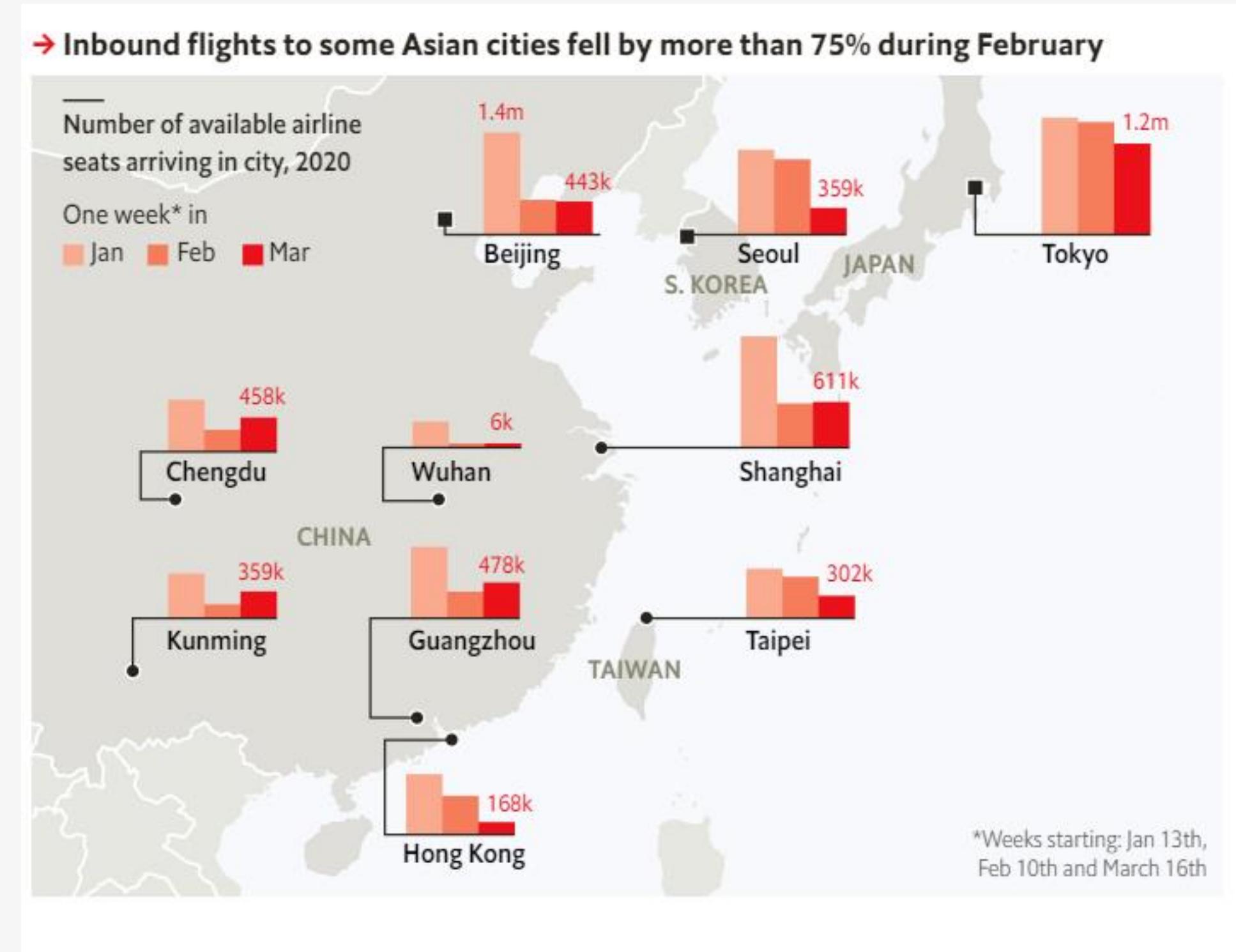


Source: <https://www.washingtonpost.com/graphics/politics/how-fair-is-the-electoral-college/>

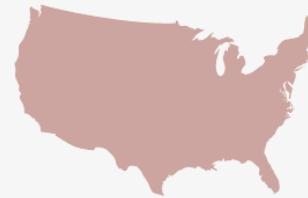


# Bar Chart on Map

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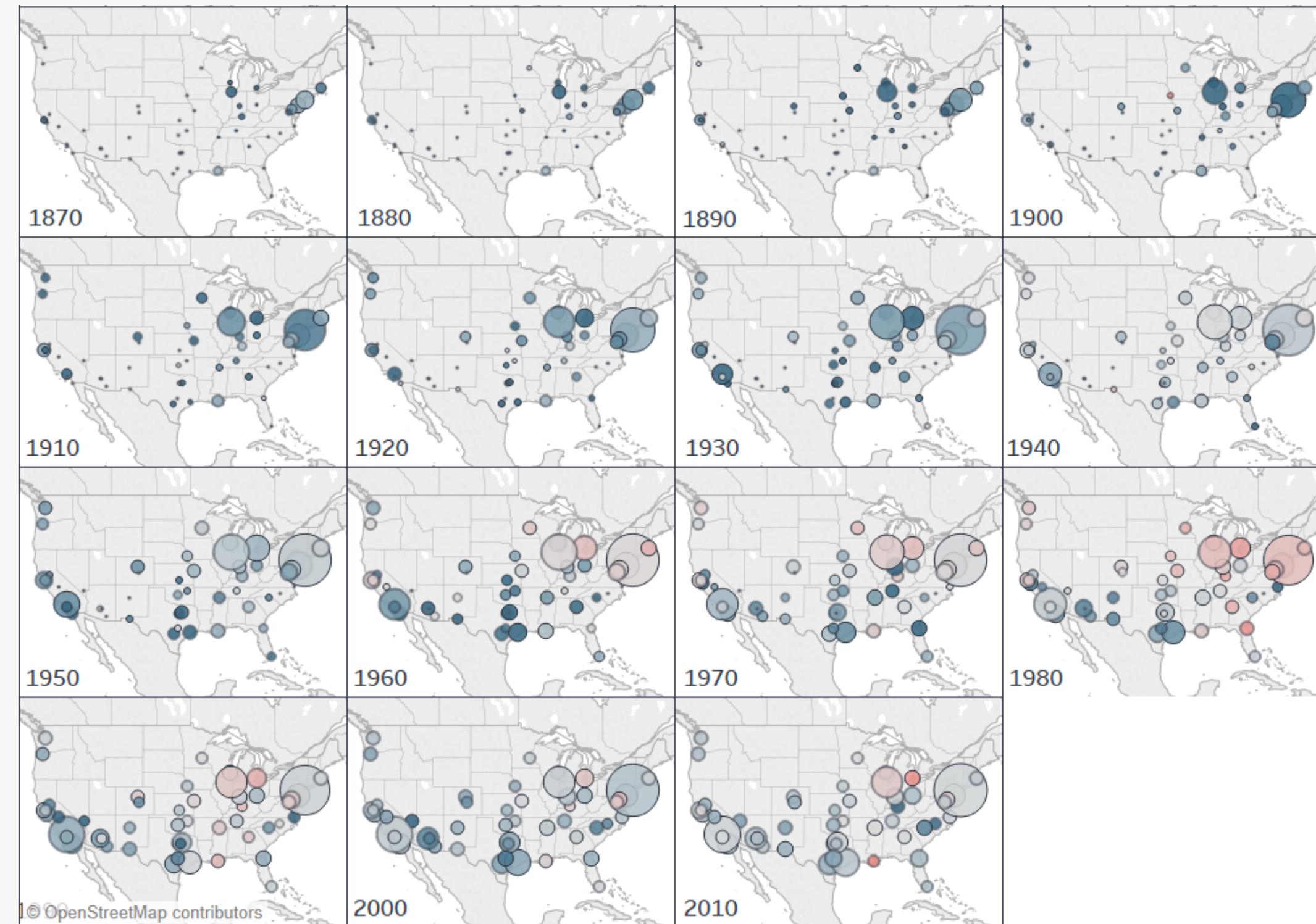


Source: <https://www.economist.com/graphic-detail/2020/03/21/as-western-flights-shut-down-chinese-routes-are-opening-again>



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# Small Multiple Map



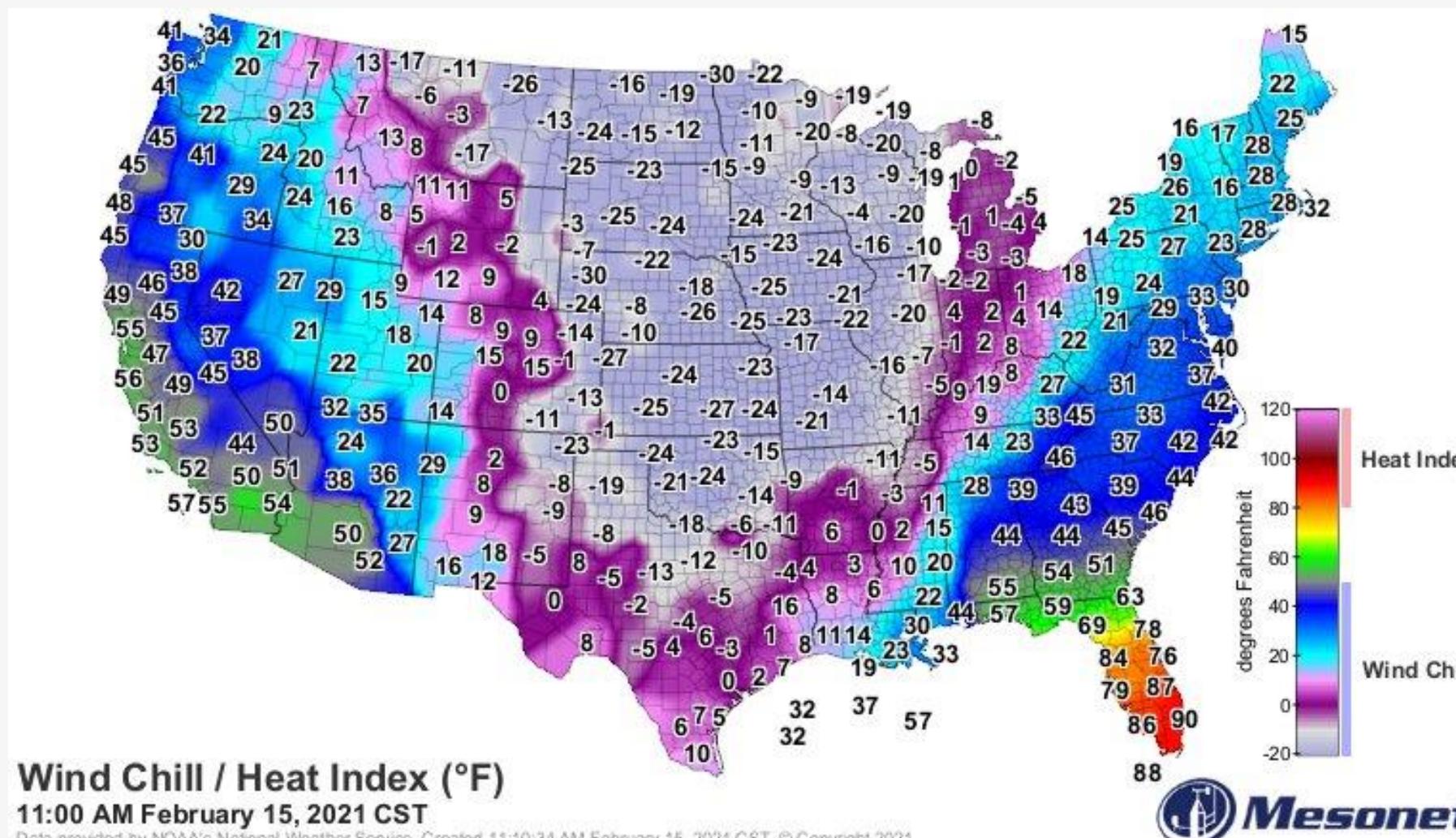
Source: <https://playfairdata.com/how-to-make-trellis-tile-small-multiple-maps-in-tableau/>



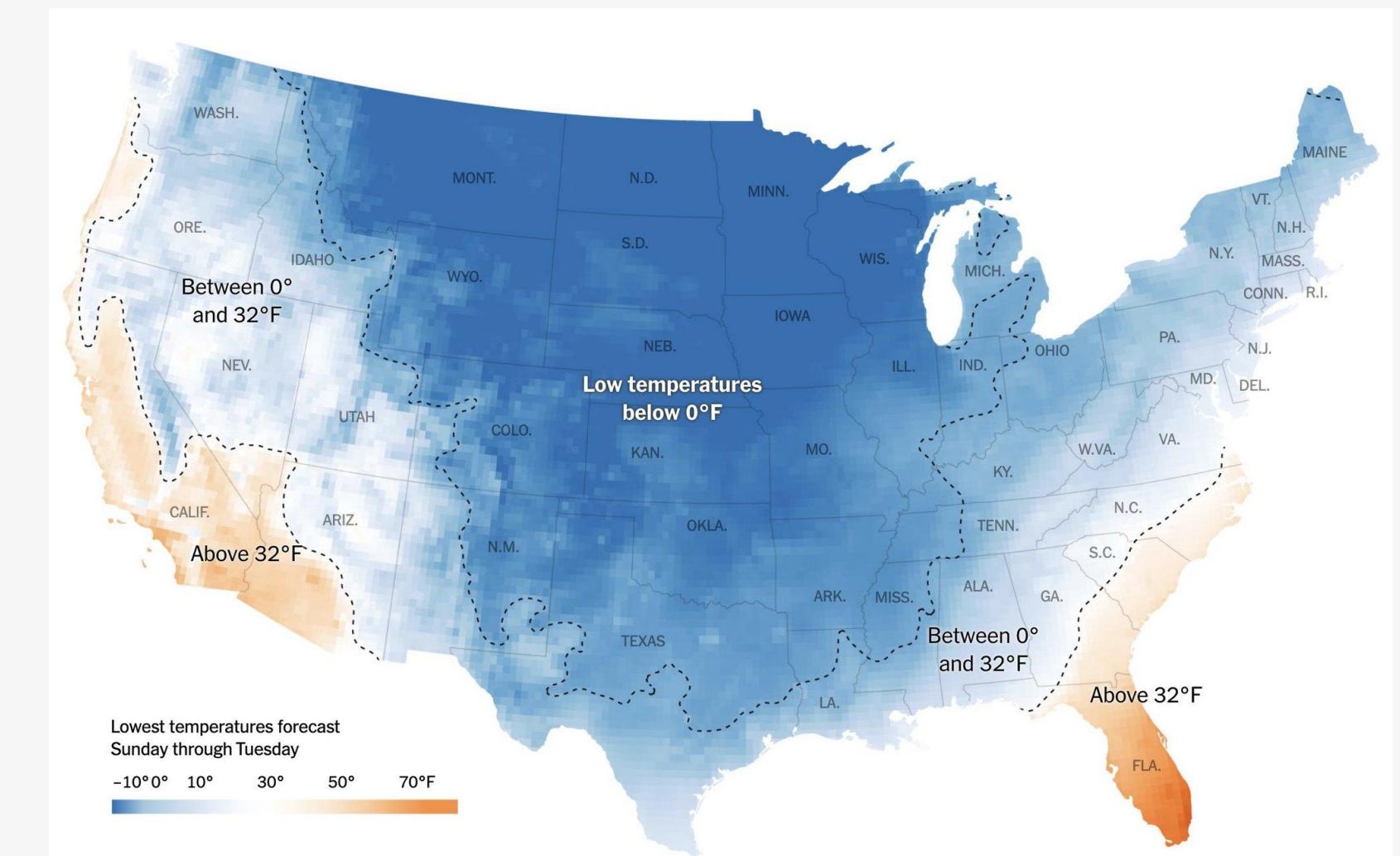
GEOSPATIAL



# Same Data, Two Maps



Source: <http://www.mesonet.org>



Source: <https://www.nytimes.com/>

"All the News  
That's Fit to Print"

# The New York Times

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SUNDAY, FEBRUARY 21, 2021

## U.S. VIRUS DEATHS NEARING 500,000 IN JUST ONE YEAR MORE THAN IN 3 WARS

### Empty Spaces in Cities, Towns, Restaurants, Homes and Hearts

By JULIE BOSSMAN

CHICAGO — A nation numb by misery and loss is confronting a new kind of grief, one that has left many to shock: 500,000.

Roughly one year after the first known case of the coronavirus in the United States, an unthinkable toll in soaring — the loss of more than 500,000 Americans.

No other country has counted so many deaths from the pandemic. America's death toll from Covid-19 is than on the battlefields of World War II and World War III.

The milestone comes at a hopeful moment. New virus cases are down sharply, and treatments and vaccines are steadily being advanced.

But there is concern about emerging variants of the virus, and it may be months before the pandemic ends.

Each death has left untold numbers of mourners, a ripple effect of loss that stretches across towns and cities. Each death has left an empty seat at a table, a chair across from a bar stool where a regular used to sit, one side of a bed now empty, a home kitchen silent in its absence.

The living find themselves amid vacuous places once occupied by their spouses, parents, children and friends — the nearly 500,000 count.

In Chicago, the Rev. Ezra Jones stands at his pulpit on Sundays, letting the silence fill the pews. That spot belonged to his son, Eddie Jones, his 83-year-old uncle, who died last year. Eddie's wife, green Chevy Manning, arrives early and that everybody up ahead had heard of Eddie's death in April.

"I can still see him there," said Eddie's pastor. "It never goes away."

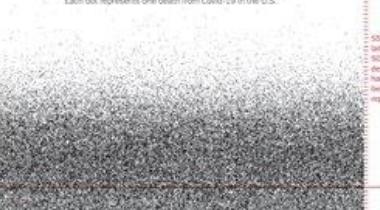
There is a street corner in Ponca, Texas, that was occupied

Continued on Page 8

### The Toll: America Approaches Half a Million Covid Deaths

Feb. 20, 2020, first report of a U.S. death, on Jan. 20.

Each dot represents one death from Covid-19 in the U.S.



APRIL 28

51,360

MAY 27

100,422

JULY 29

151,172

SEPTEMBER 22

206,738

NOV. 18

250,415

DEC. 14

301,016

JAN. 10

401,636

FEB. 3

450,703

AS OF 10 P.M.  
SATURDAY

497,380

Source: Robert Koch Institute; The New York Times

TAKURO KAWABE/LAURENCE FREYER, REBECCA EHRENBACH/SYGMA FOR THE NEW YORK TIMES

### Garland Faces Resurgent Peril Of Extremism

### Oklahoma City Attack Shaped His Views

By MARK LEIBOVICH

WASHINGTON — Judge Merrick B. Garland always made a point of wearing a coat and tie when he appeared in court, even at the site of the 1995 Oklahoma City bombing, the worst domestic terrorist attack in American history.

He had been dispatched from Washington to oversee the case for the Justice Department, and his solid colleagues could be viewed as a symbol of a government that once respected law.

As the country nears a grim milestone of 100,000 deaths attributed to the virus, The New York Times sought to understand the attitudes of the victims. The 1,000 people here reflect just 1 percent of the toll. None were lost to the virus.

Even as the country was triggering winter storms,法官Garland was in the courtroom, facing off against a prosecutor who was seeking the death penalty for Timothy McVeigh, the bomber.

"It really looked like a war zone," Judge Garland said in an interview. "The庭 was filled with the sound of shouting, the destroy and still smoldering building, part of an oral argument, and the sound of the Oklahoma City National Memorial and Museum. The site was like a scene from a movie."

He had been told that the courtroom was packed with reporters and several other states. One-third of oil production in the nation was at risk, and the price of crude oil in Ohio was knocked offline. Road networks nationwide were disrupted, and flights were delayed or canceled.

The continuing winter storms triggered blackouts in the Midwest and several other states. One-third of oil production in the nation was at risk, and the price of crude oil in Ohio was knocked offline. Road networks nationwide were disrupted, and flights were delayed or canceled.

The crisis carries a profound sense of unease. The weather brings more frequent and intense storms, floods, heat waves, wildfires, droughts, drinking water systems, power plants, electrical grids, industrial waste sites and grain elevators.

With the economy in free fall, the sector can set off a domino effect of breakdowns.

On the Oklahoma City case, he said, "It was the most important thing I had ever done in my life." He was Presiding Judge of the Court of Appeals for the 10th Circuit, which was seeing the deepest drop in its caseload since the 1990s.

"It was not something we were doing nothing," he said. "It was just a day-to-day effort to make sure that the system was working."

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### STORMS EXPOSING A NATION PRIMED FOR CATASTROPHE

### CLIMATE CHANGE WRATH

By MARK LEIBOVICH

WASHINGTON — Facing Power Grids, Water and Roads

This article is by Christopher Flavelle, Brad Plumer and Hiroko Matsuoka.

Even as the country was triggering winter storms,法官Garland was in the courtroom, facing off against a prosecutor who was seeking the death penalty for Timothy McVeigh, the bomber.

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### Unprepared for Threats

### Facing Power Grids, Water and Roads

This article is by Christopher Flavelle, Brad Plumer and Hiroko Matsuoka.

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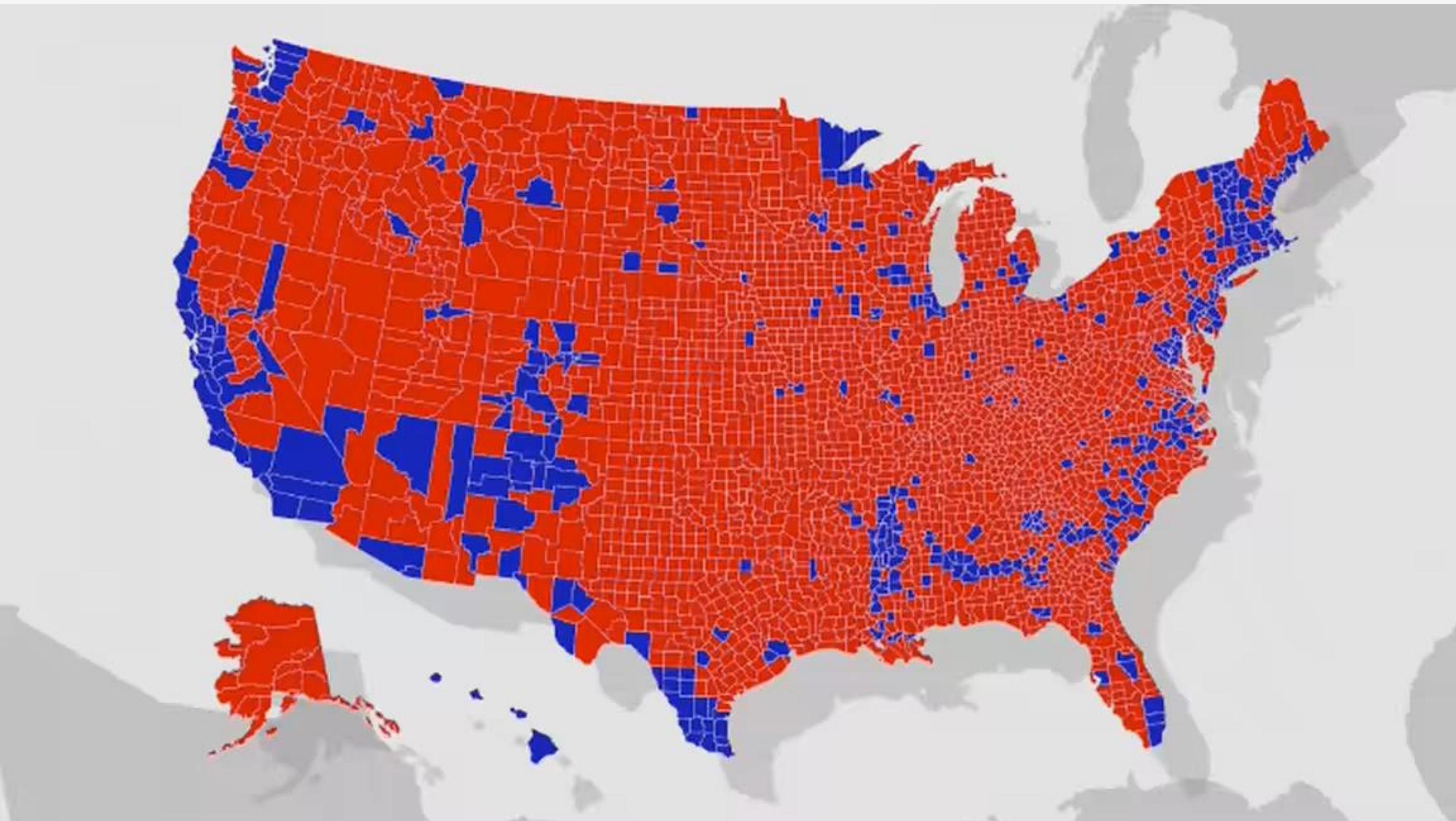
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Source: <http://try-to-impeach-this.jetpack.ai/>

# Exercise

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- **Audience:** your classmates
- **Question:** What has changed in over a century of Nobel awards?
- **Ask:** create minimum two charts and place them within a Tableau story

WHAT DID  
YOU LEARN?

