Recommendations for a National Pandemic Dashboard

The COVID Tracking Project

The goal

Create a mobile-ready, accessible dashboard that helps Americans quickly understand where transmission is occurring and what level of precautions they should take to reduce their risk. The dashboard should serve everyone in the United States and be immediately helpful to older Americans, communities underserved by the pandemic response, and others at high risk.

Overall Best Practices

Best practices

INFORM, EDUCATE, AND REASSURE.

- **Prioritize clarity:** Put the most important data point associated with each metric front and center.
- **Build trust through transparency:** Offer obvious, accessible ways for visitors to learn more about each metric's meaning and sources. Offer a historical time-series for all metrics and demographic data, and let people easily download and explore it.
- **Use structure and consistency to boost understanding:** Thoughtfully group metrics and consistently report data points in the same place and in the same way, every time.

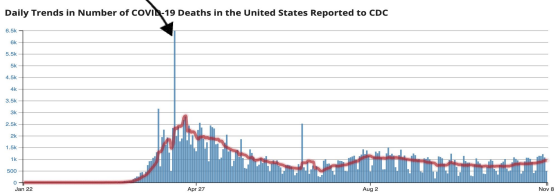
The dos

- **Do:** Highlight current numbers in large type on top of the dashboard
- **Do:** Clearly define section headers with logically grouped data points
- **Do:** Include explanations for apparent abnormalities
- **Do:** Include case, test, and death counts per capita as well as in absolute numbers to account for population differences
- **Do:** Update data on a regular schedule (e.g. daily by 2 pm ET)

The don’ts

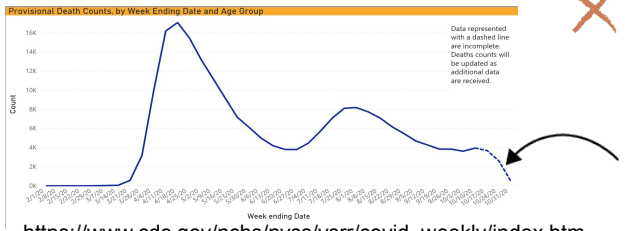
- **Don’t:** Let outlier numbers distort the Y-axis of charts, and thereby the underlying trends.

This large single-day of backlog reporting from NYC extends the Y-axis, hiding the subsequent rises and falls of deaths.



https://covid.cdc.gov/covid-data-tracker/#trends_dailytrendsdeaths

- **Don’t:** Present incomplete data to a general audience in ways that misrepresent current trends, even with text explanations.



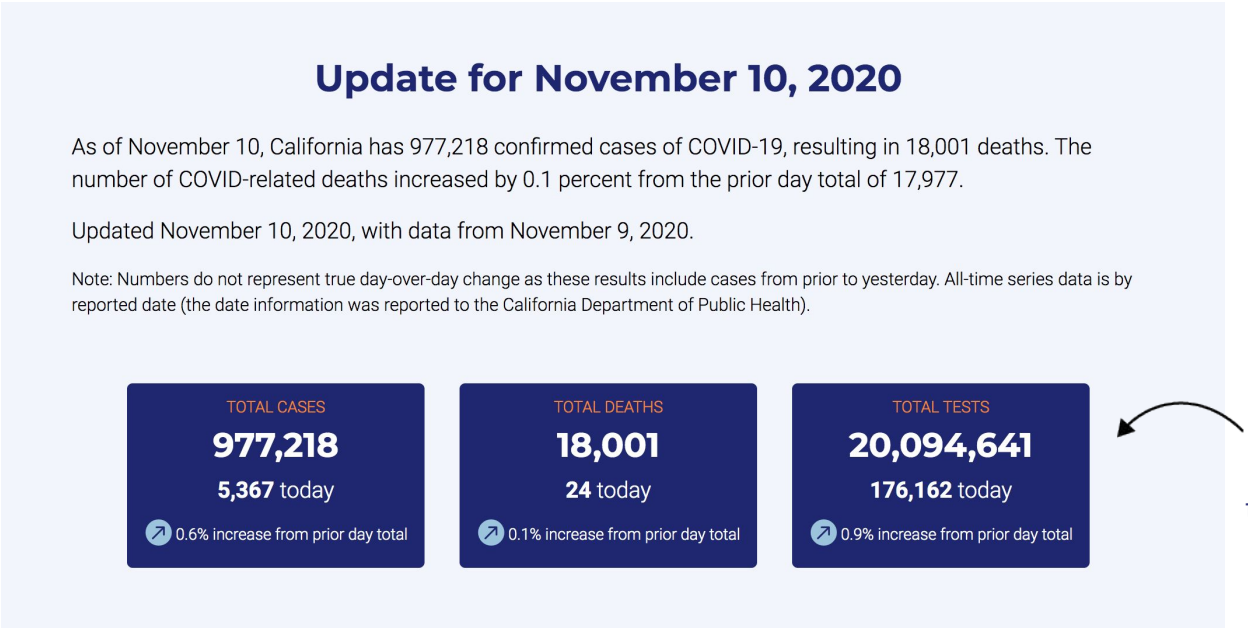
https://www.cdc.gov/nchs/nvss/vsrr/covid_weekly/index.htm

Deaths are rising, but this visualization of incomplete data makes it appear that deaths are falling, which the average person nearly always misinterprets.

A Standout Example

A standout example: topline

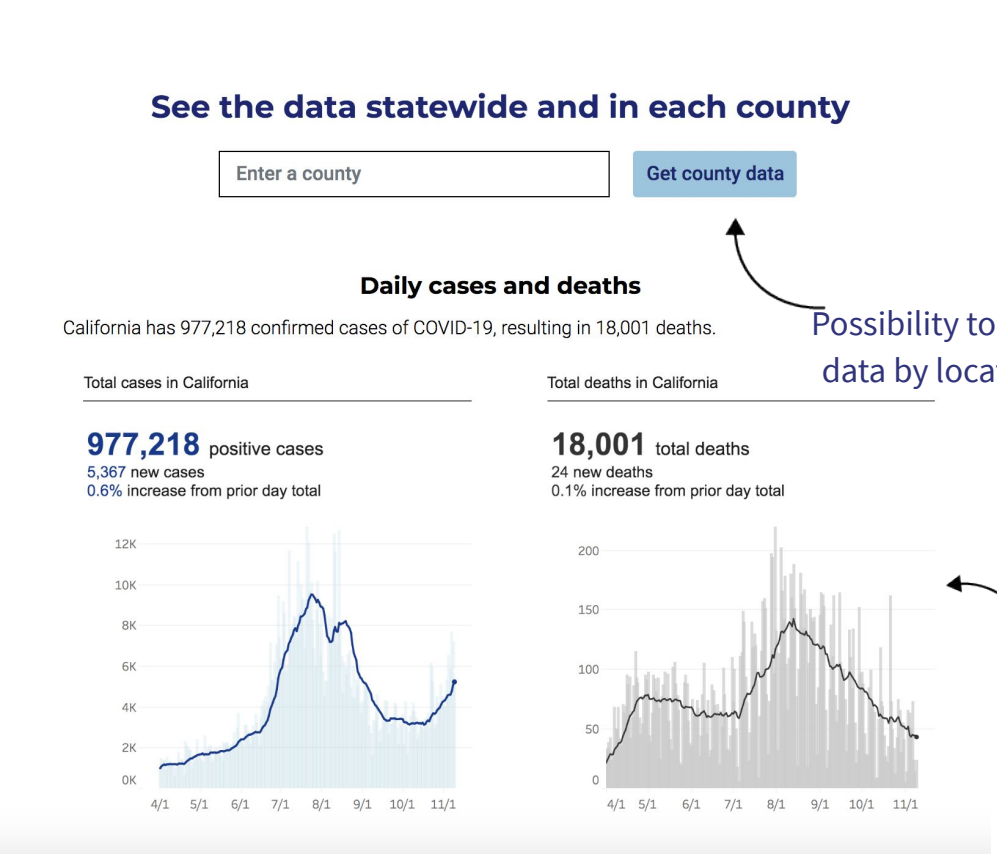
California's dashboard is an example of a clear and informative page.



Topline metrics: totals and change

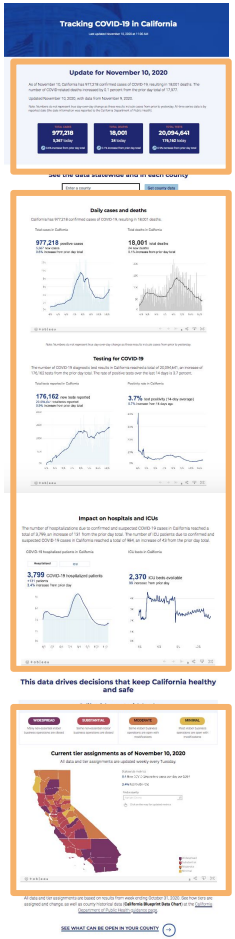
CA: covid19.ca.gov/state-dashboard/

A standout example: charts and drilldowns



Possibility to filter data by location

Detailed view of state metrics, each in its own section

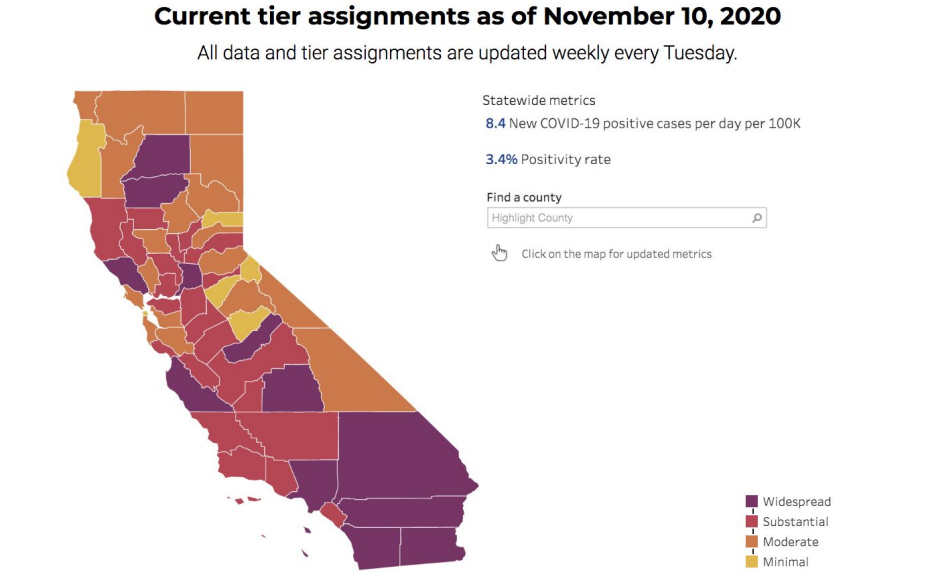


Simple bar charts with 7-day average lines are really effective

CA: covid19.ca.gov/state-dashboard/

A standout example: risk-level communication

Calculated risk assessment by location



CA: covid19.ca.gov/state-dashboard/

Crucial Metrics

Crucial metrics

- **Daily New Cases**
  - Absolute and per capita
- **Daily New Tests**
  - Absolute and per capita
  - RT-PCR/molecular and rapid/antigen tests (reported separately)
  - Report at least positives and totals to allow for test positivity calculations
- **Test Positivity (Rolling 7-Day Average)**
  - Positive tests over all tests (not cases over all tests)
- **Currently Hospitalized and in ICU**
- **Daily New Deaths**
  - Absolute and per capita

Easy Design Wins

Easy design wins

SIMPLICITY AND CLARITY FIRST.

- **Use the simplest possible design elements and consistent color coding**
  - Assign a color to each major metric and don’t reuse them for other metrics (e.g., use orange for all case counts).
- **Give the data breathing room**
  - Avoid crowded interfaces that overwhelm users.
- **Avoid off-the-shelf dashboards and PDFs for displaying data**
  - Use customizable, accessible, responsive tools that allow for text searching.

Design For Everyone

Design for everyone: basics many agencies struggle with

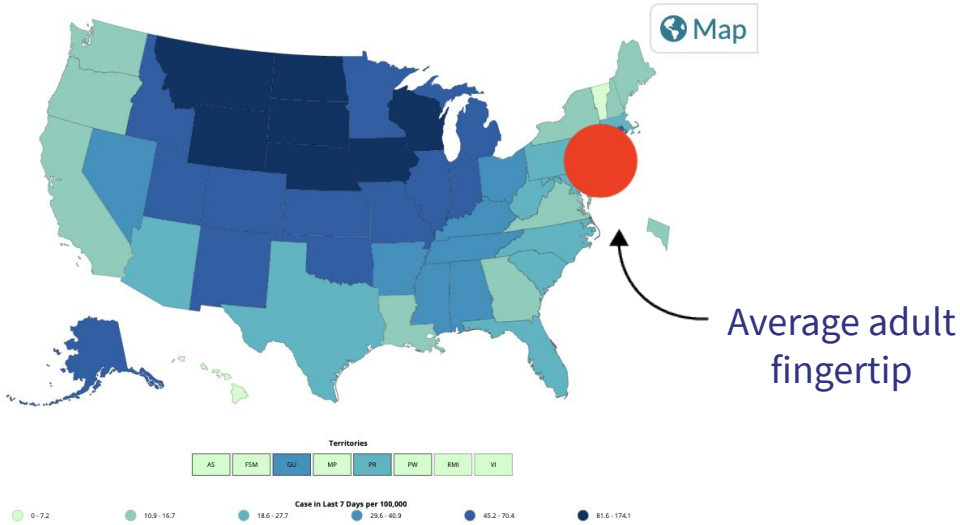
CONSIDER ALL USERS.

- **Inclusivity:** Develop in ways that give everyone full access, regardless of their ability, device, or connection speed.
- **Performance:** Keep all pages lean and performant, with low-end devices, mobile use, and shaky connections in mind.
- **Transparency:** Surface information easily—don’t hide data behind hover effects, and make sure anything offered as a map is also provided as a table and as a downloadable CSV.

Design for everyone: maps come with complexities

Map-heavy navigation is especially difficult for people with disabilities or on phones. You can't look up Delaware if your fingertip ● covers the entire Northeast.

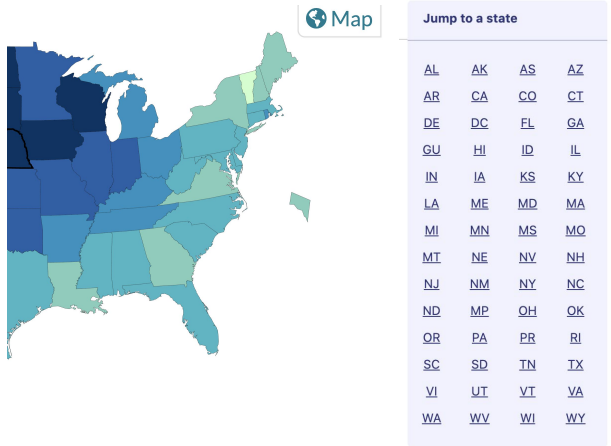
Problem



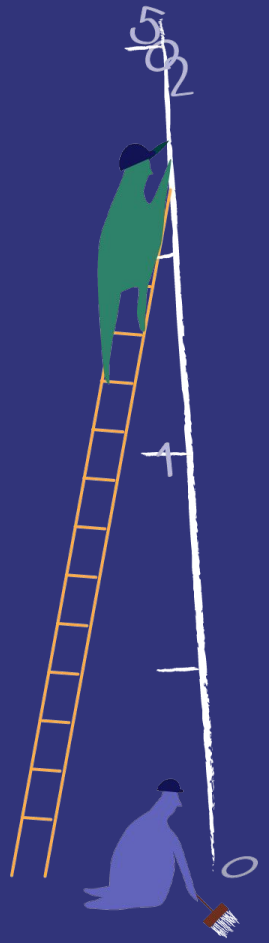
CDC: covid.cdc.gov/covid-data-tracker

Solution

Add a separate list of states to tap or click, or a zoom tool.



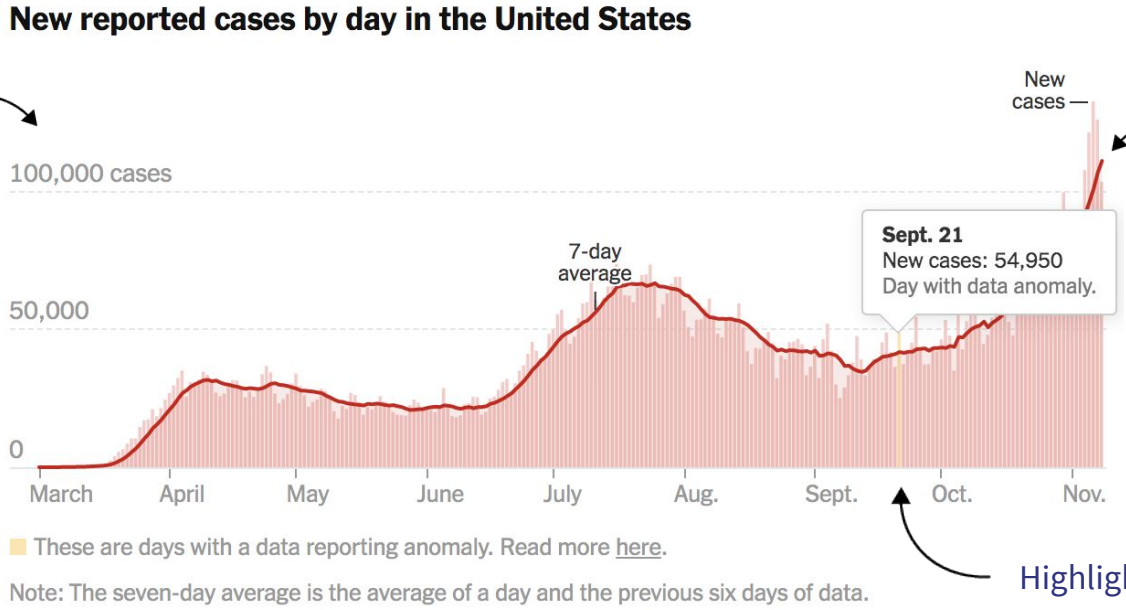
Details That Matter



Graphics that build understanding and trust

ANNOTATE AND DISCLAIM.

Use clear titles, legends, and labels for charts



Always include a 7-day or 14-day rolling average to make up for data anomalies

Provide notes and/or annotations with caveats explaining data anomalies

Highlight data points that are data anomalies

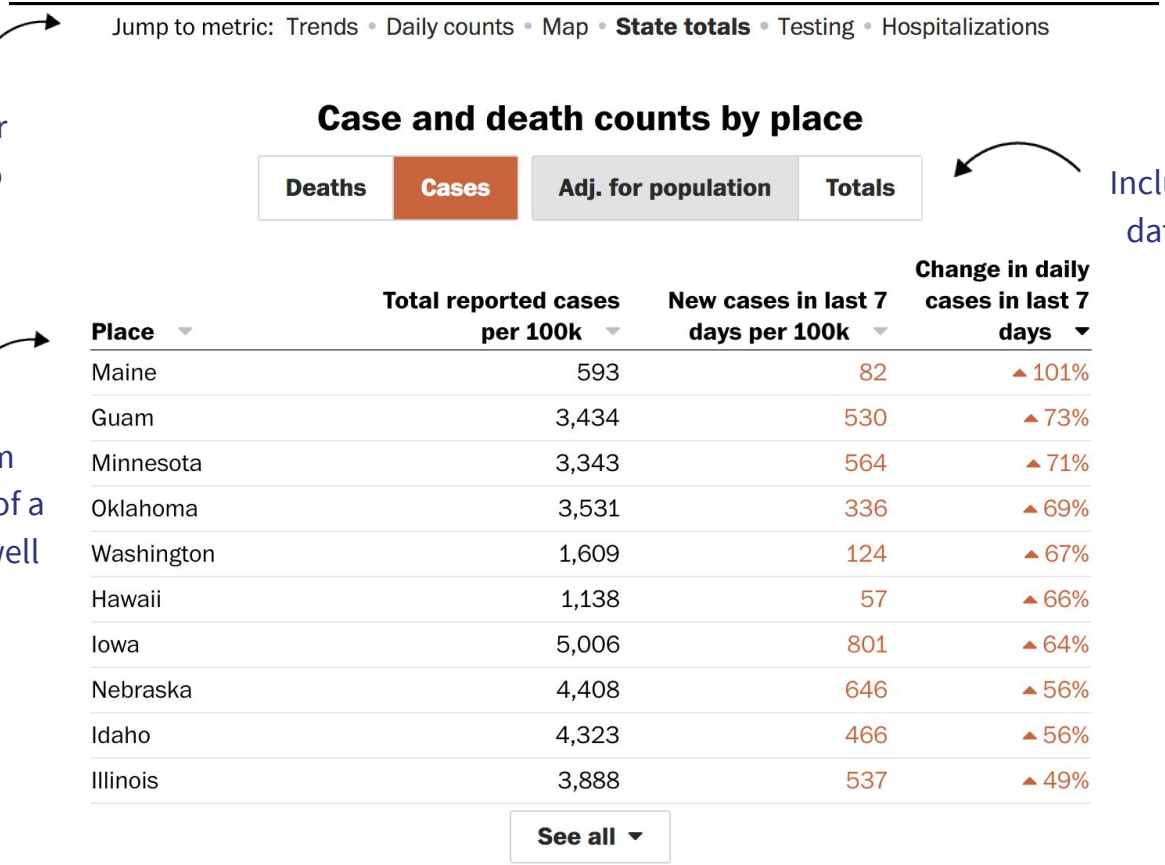
Graphic by The New York Times.

Navigation, toggles, and tables

Have a navigation bar that takes the user to different metrics

Include a toggle for data adjusted for population

Include data from charts in the form of a sortable table as well



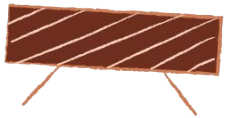
Graphic by The Washington Post.

Calculating test positivity

COMMUNICATE UNITS AND METHODS.

The dos

- **Do:** Use a 7-day rolling average to smooth out daily inconsistency
- **Do:** Communicate about anomalies causing spikes and dips in test positivity (like testing backlogs and data dumps)
- **Do:** Build trust by publishing a short FAQ explaining federal test positivity methods and differences from other sources



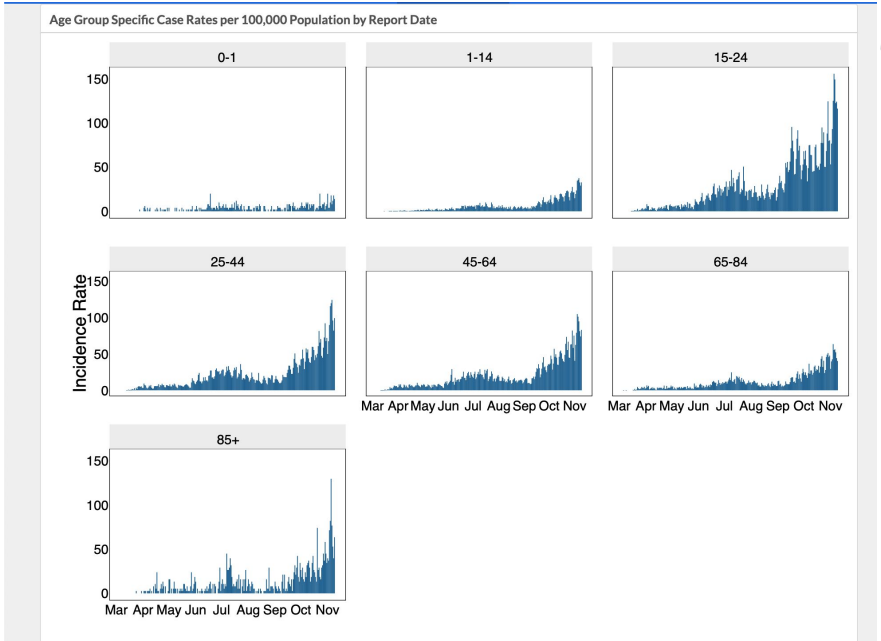
The don’ts

- **Don’t:** Publish a single-day test positivity calculation
- **Don’t:** Lump antigen, PCR, and antibody tests together. Calculate test positivity over PCR tests only
- **Don’t:** Mix units across jurisdictions. All jurisdictions should be calculated in the same way, using the same positive and total test units

Example Patterns for Difficult Data Elements

Age and sex data

PLACE THE DATA IN CONTEXT.



UT: coronavirus.utah.gov/case-counts/

Present a time-series, not just cumulative numbers

Disaggregate age data by race and ethnicity

Proportions of Cases and Deaths by Race and Ethnicity Among Ages 0-17

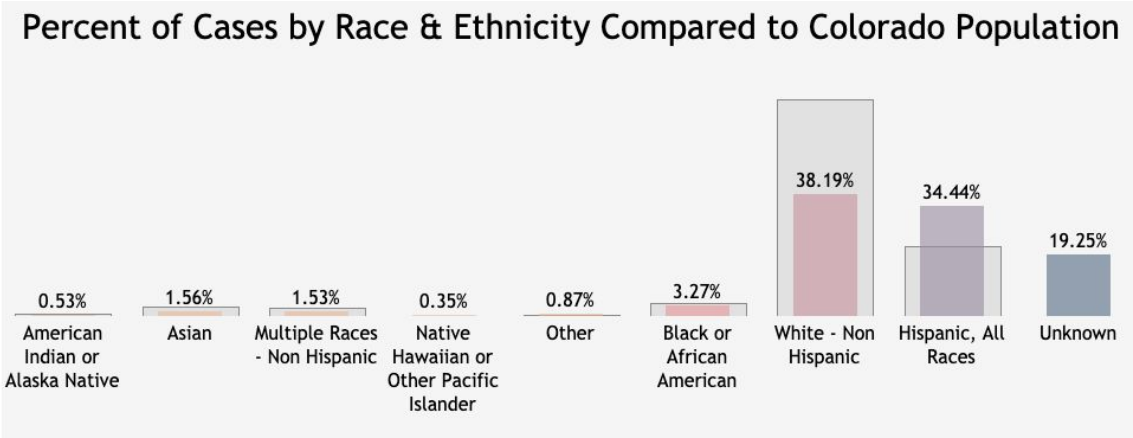
Race/Ethnicity	No. Cases	Percent Cases	No. Deaths	Percent Deaths	Percent CA Population
Latino	56,317	72.4	1	50.0	47.9
White	7,501	9.6	0	0.0	29.2
Asian	2,382	3.1	1	50.0	12.7
African American	2,122	2.7	0	0.0	5.4
Multi-Race	908	1.2	0	0.0	4.0
American Indian	220	0.3	0	0.0	0.4
Native Hawaiian and other Pacific Islander	256	0.3	0	0.0	0.3
Other	8,099	10.4	0	0.0	0.0
Total	77,805	100.0	2	100.0	100.0

Cases: 105,792 total; 27,987 (26%) unknown race/ethnicity
Deaths: 2 total; 0 (0%) unknown race/ethnicity
***Census data does not include 'other race' category**

CA: cdph.ca.gov/Programs/CID/DCDC/Pages/COVID-19/Race-Ethnicity.aspx

Race and ethnicity data

REVEAL DISPARITIES.



Compare data with overall population for each race/ethnicity

CO: covid19.colorado.gov/data

	American Indian or Alaska Native	Asian	Black	White	Other	Unknown
Non Hispanic	574	366	37,896	40,387	1,417	622
Hispanic	21	15	179	1,072	2,005	199
Unknown Ethnicity	803	103	8,703	10,343	5,087	17,413

MS: msdh.ms.gov/msdhsite/_static/14,0,420.html#charts

Report both whole numbers and percentages for precision and understanding

Present crosstabs of race and ethnicity, race and age, etc.

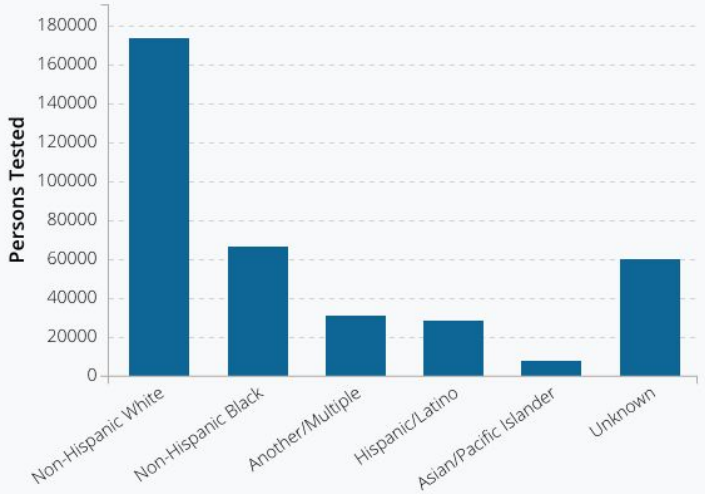
Race and ethnicity data

Share data in graphics, numbers, and downloadable CSVs

Make data available at different scales (statewide, by county, by ZIP code)

Updated: 11/09/2020

Total Persons Tested by Race/Ethnicity



Total Persons Tested by Race/Ethnicity & County

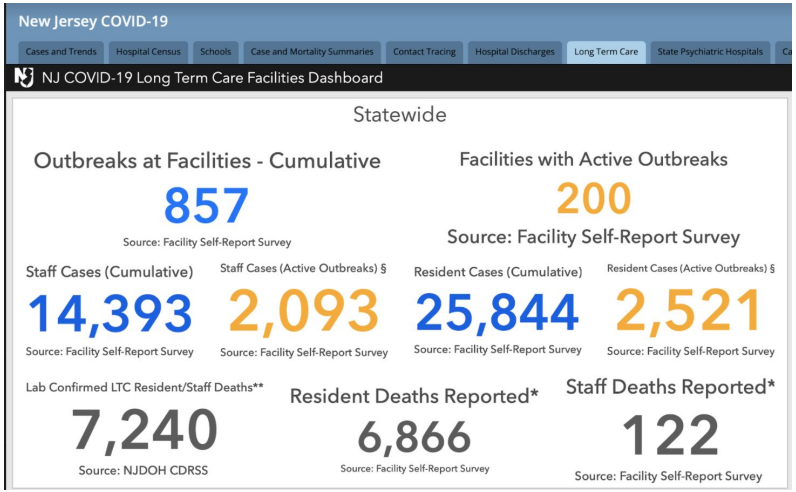
RACE/ETHNICITY	STATE OF DELAWARE	NEW CASTLE	KENT	SUSSEX
Non-Hispanic White	173,354	98,520	19,777	46,446
Non-Hispanic Black	66,863	44,138	10,080	8,444
Another/Multiple	31,024	18,820	2,657	7,212
Hispanic/Latino	28,310	17,775	2,239	7,084
Asian/Pacific Islander	8,139	6,677	635	580
Unknown ⓘ	59,890	31,735	11,904	12,804

DE: myhealthycommunity.dhss.delaware.gov/locations/state

Long-term care facility data

GET GRANULAR AND STRUCTURE DATA CAREFULLY.

Include the cumulative and current number of facilities with an outbreak



Report resident and staff cases and deaths separately

(These are not perfectly designed, but the metrics on offer are great.)

Report both cumulative and current outbreak case counts

NJ: covid19.nj.gov/#live-updates

WV: dhhr.wv.gov/COVID-19/Pages/default.aspx

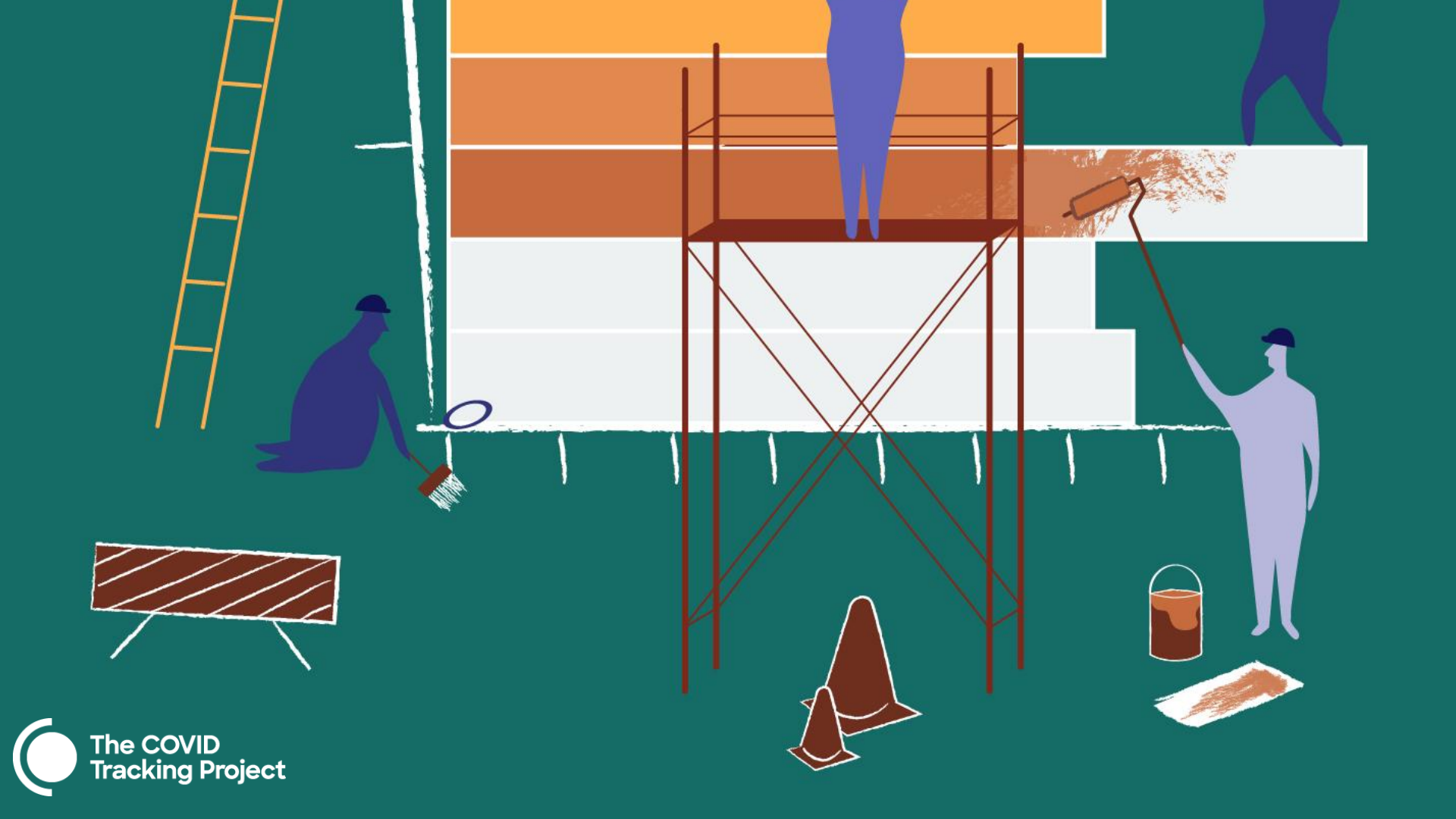
Resources

Dashboards cited:

The New York Times, The Washington Post, CDC, California, Colorado, Delaware, Mississippi, New Jersey, Utah, West Virginia.

More resources:

- Tips to visualize COVID-19 data in an accurate and clear way
- More race and ethnicity data dashboard element examples
- Post: "Test Positivity: So Valuable, So Easy to Misinterpret"
- Post: "Test Positivity in the US Is a Mess"
- Post: "Race and Ethnicity Data: What's Changed, and What Still Needs Improvement"


The COVID
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