

Tracking & Forecasting COVID from the front line

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My job as Dir. of Epidemiology: Provide information & predictions

- Current situation
- Near term: What may happen in the next 2 weeks or months?
- Long term: Is the worst behind us? How bad might it get?
- “Today’s most relevant point”

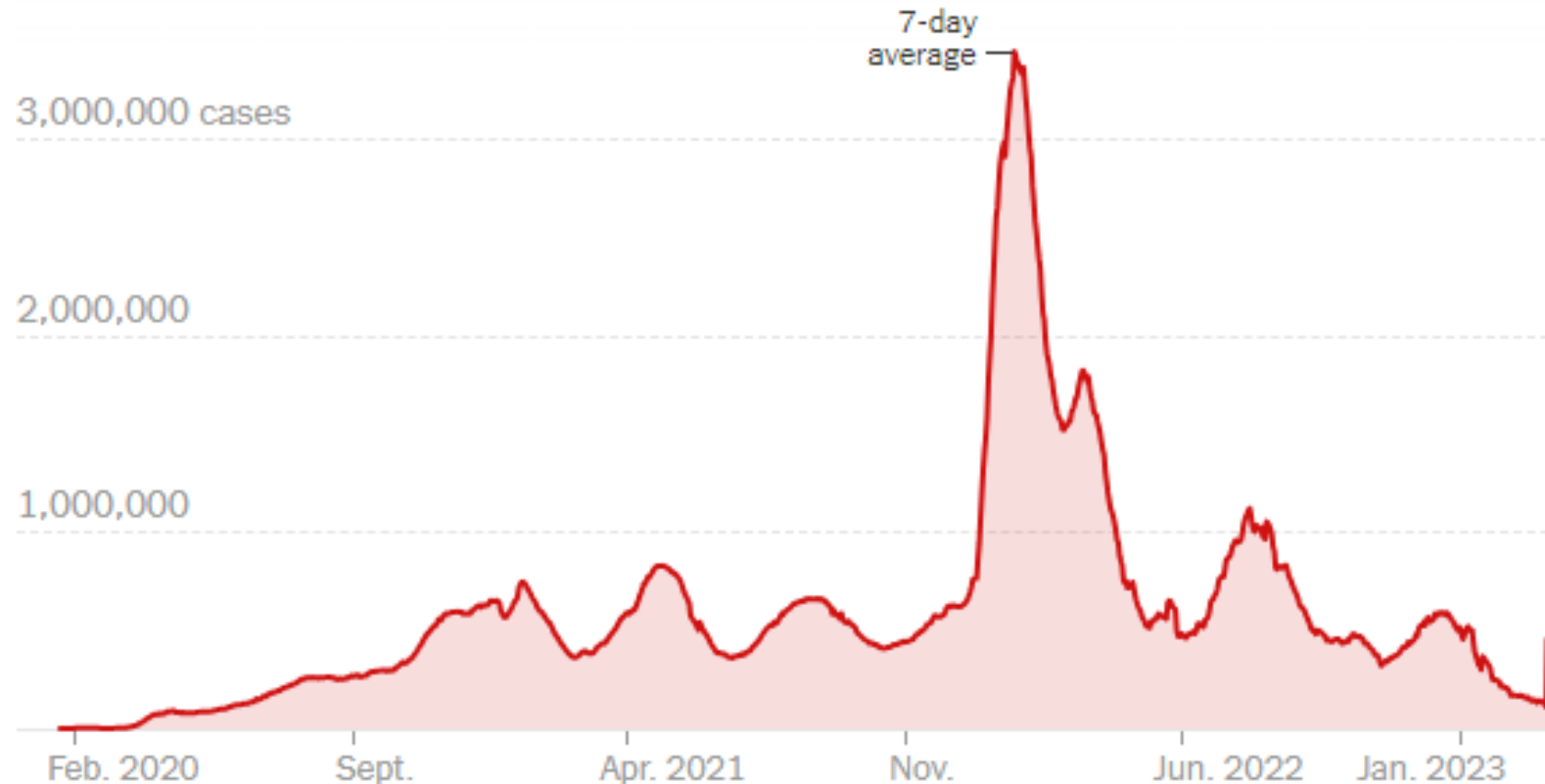
My COVID situation review process: It takes a village ... of data sources

1. Stats & trends: Global, US, Indiana, Marion County
2. Variants' relative prevalence & growth
3. Levels of current prevention efforts
4. Predictions, models
5. Latest studies

Goal: Combine data & context into overall prediction
Quantify degree of confidence in that prediction

Preparing Today's USA COVID Forecast: Worldwide trend in reported cases

New reported cases by day



<https://www.nytimes.com/interactive/2021/world/covid-cases.html> Accessed: 2023-06-13

Preparing Today's USA COVID Forecast: Country trends in reported cases

Daily new confirmed COVID-19 cases per million people

7-day rolling average. Due to limited testing, the number of confirmed cases is lower than the true number of infections.

Our World
in Data

LINEAR LOG All together ▾

5,000

4,000

3,000

2,000

1,000

0

Jun 28, 2021

Dec 21, 2021

Mar 31, 2022

Jul 9, 2022

Oct 17, 2022

Jan 25, 2023

Jun 7, 2023

Daily new confirmed COVID-19 cases per million people

7-day rolling average. Due to limited testing, the number of confirmed cases is lower than the true number of infections.

Our World
in Data

LINEAR LOG All together ▾

120

80

40

20

0

Apr 15, 2023

Apr 25, 2023

May 5, 2023

May 15, 2023

May 25, 2023

Jun 7, 2023

Jun 2, 2023

Spain

France

Italy

Europe

Canada

Mexico

Germany

United Kingdom

Japan

United States

67.07

43.69

32.09

18.48

12.88

6.37

4.91

0.41

0.00

0.00

Spain

France

Italy

Canada

Europe

Germany

Mexico

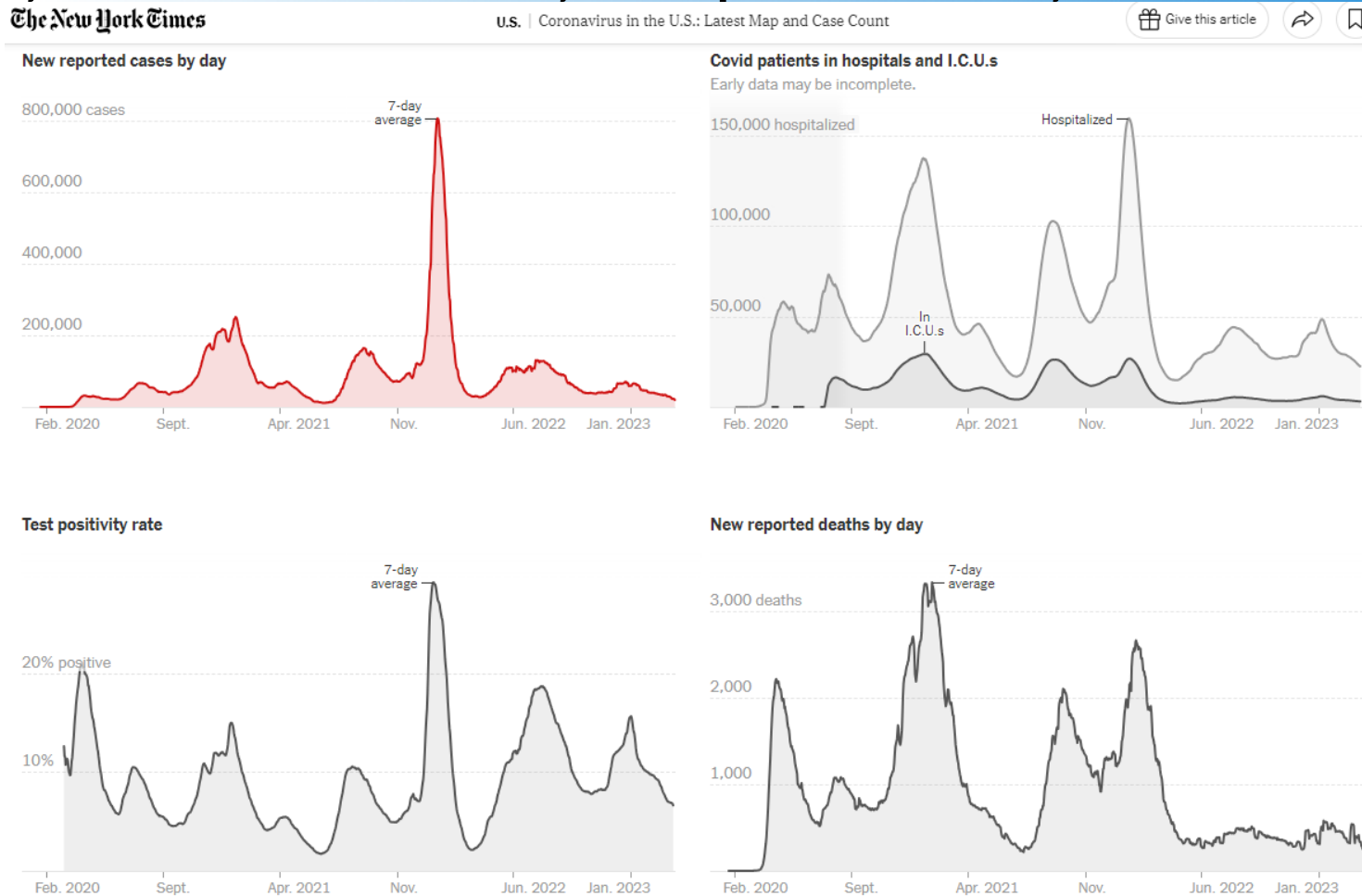
Japan

United Kingdom

United States

<https://ourworldindata.org/explorers/coronavirus-data-explorer> Accessed: 2023-06-13

Preparing Today's USA COVID Forecast: US cases, admissions, % positive, deaths



<https://www.nytimes.com/interactive/2021/us/covid-cases.html> Accessed: 2023-06-13

Preparing Today's USA COVID Forecast: Dominant Variants

SARS-CoV-2 variants in analyzed sequences, United States

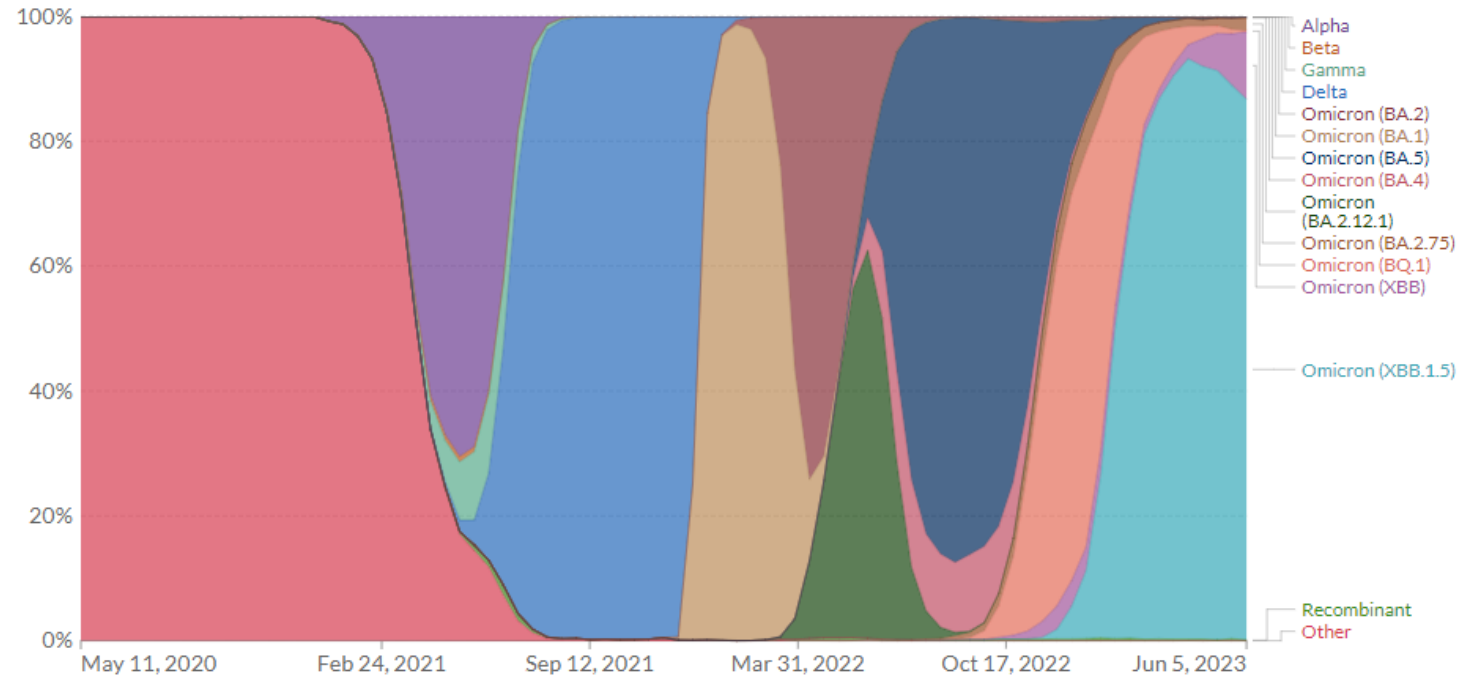
The number of analyzed sequences in the preceding two weeks that correspond to each variant group. This number may not reflect the complete breakdown of cases since only a fraction of all cases are sequenced.

Our World
in Data

+ Add country or region

All together

☒ Relative

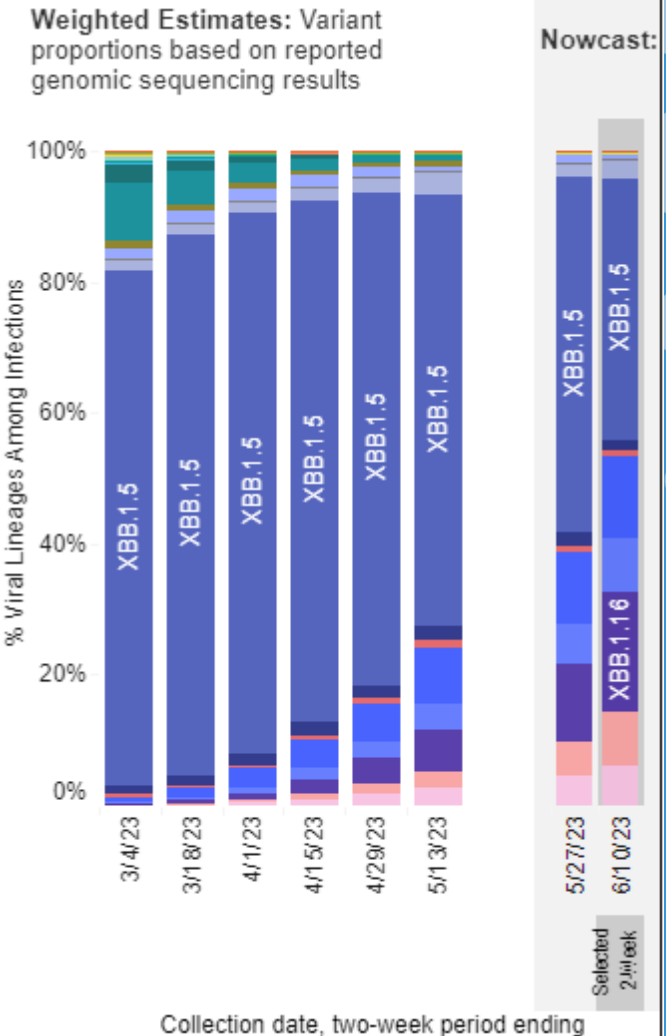


Source: GISAID, via CoVariants.org - Last updated 13 June 2023

Note: Recently-discovered or actively-monitored variants may be overrepresented, as suspected cases of these variants are likely to be sequenced preferentially or faster than other cases.

OurWorldInData.org/coronavirus • CC BY

<https://ourworldindata.org/grapher/covid-variants-area?country=~USA> Accessed: 2023-06-13



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

Accessed: 2023-06-13

Today's USA COVID Forecast Conclusion: Improving. Monitor new variants outcomes

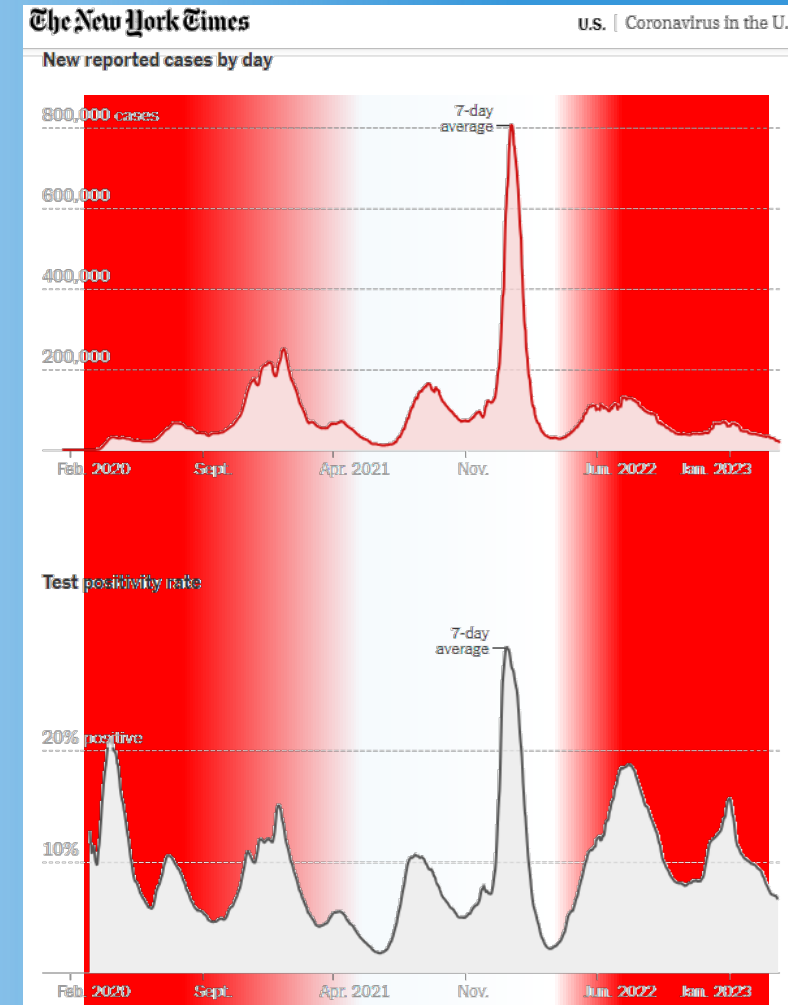
- Cases declining:
 - Worldwide
 - In countries with similarities to USA
 - In USA
- USA % positive, hospitalizations, & deaths declining
- New variants rapidly displacing prior variants

Conclusion: there is low, decreasing risk. Wildcard: severity from new variants.

Context Matters: Interpretations can change with context, especially in dynamic situations

Graph: COVID # cases & % positive tests (USA)

- Early & late in pandemic, mostly high risk patients tested
 - High risk → High % positive
- % positive tests (bottom) changed how it indicated COVID spread (cases, top)
 - Early pandemic: mostly severe cases are tested
 - Mid pandemic: almost everyone is tested
 - Late pandemic: mostly severe cases are tested



Theme: Analytics don't provide certainty but are still informative

- Expect minor changes in data
- Think of statistics as estimates, not precise facts
- A statistic's meaning changes as conditions change

“Uncertain” does NOT mean “Uninformative”

Guidance for consumers of disease forecasts

- Build relationships before the emergency
- Validate (check reputation, compare) before trusting an information source
- For current estimates
 - Compare to statistics from the past or from other places
 - Use rates, not counts. Pay attention to denominators (ask “among who?”)
 - Expect evolving situations to change interpretations of data
 - Filter out unlikely causes. Ask for evidence and likely magnitude of impact of the cause.
 - Ignore minor changes in data. Ask, “Does the difference matter for decision making?”
- For models & predictions
 - Demand degree of confidence & rationale
 - Ask about model assumptions. What would change results or invalidate the model?
 - Ask about the limits of a model’s generalizability. Who does it represent?

Real-time situation assessment

- [World trend in cases & deaths](#)
- [Trends in countries with similarities to USA](#)
- [US cases, admissions, % positive, deaths](#)
- [Changes in dominant variants](#)
- [Variant “nowcast”](#)