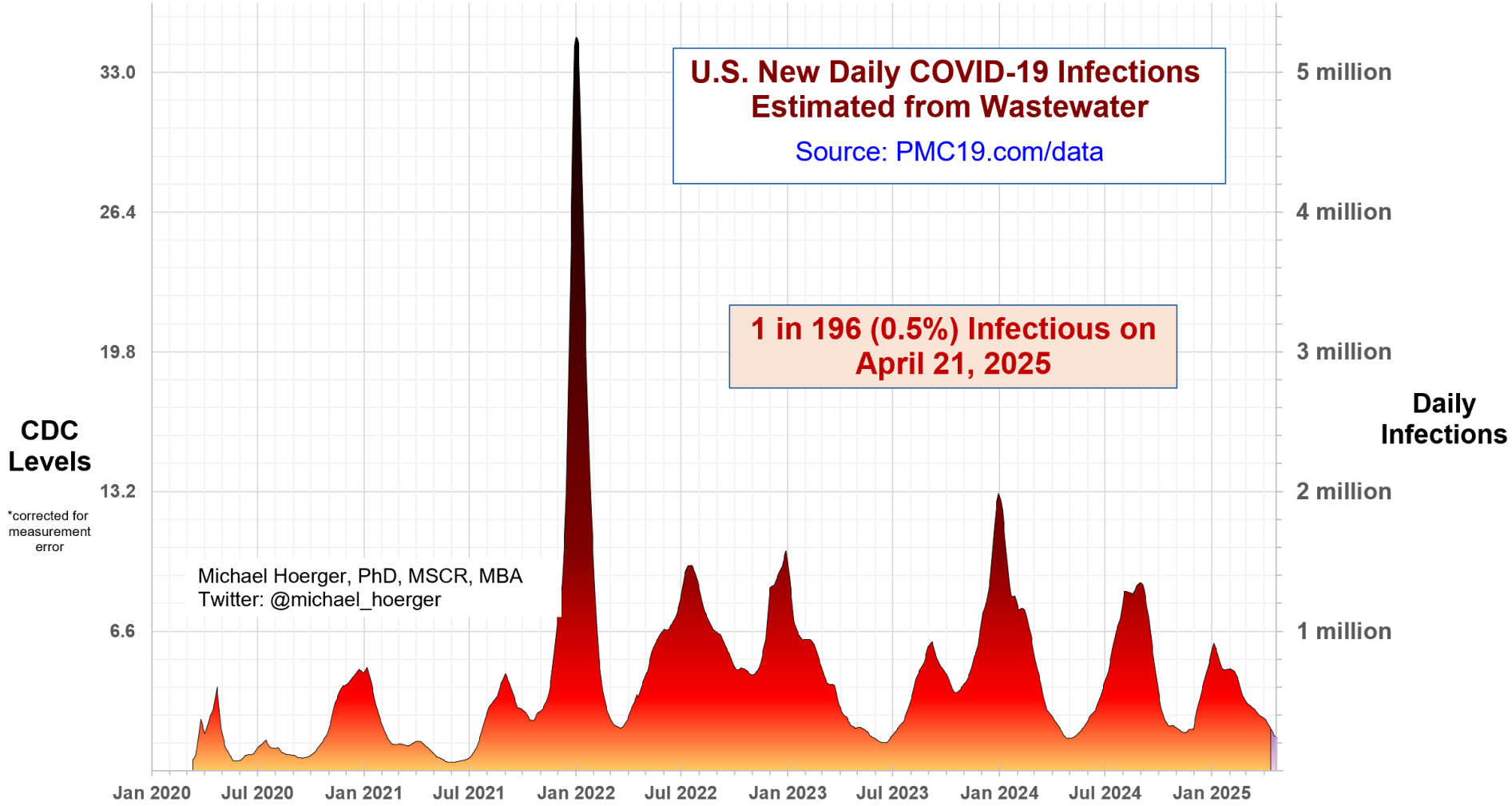
PMC U.S. COVID-19 Case Estimation and Forecasting Model: Report for April 21, 2025, pmc19.com/data

Michael Hoerger, PhD, MSCR, MBA, Pandemic Mitigation Collaborative (PMC)



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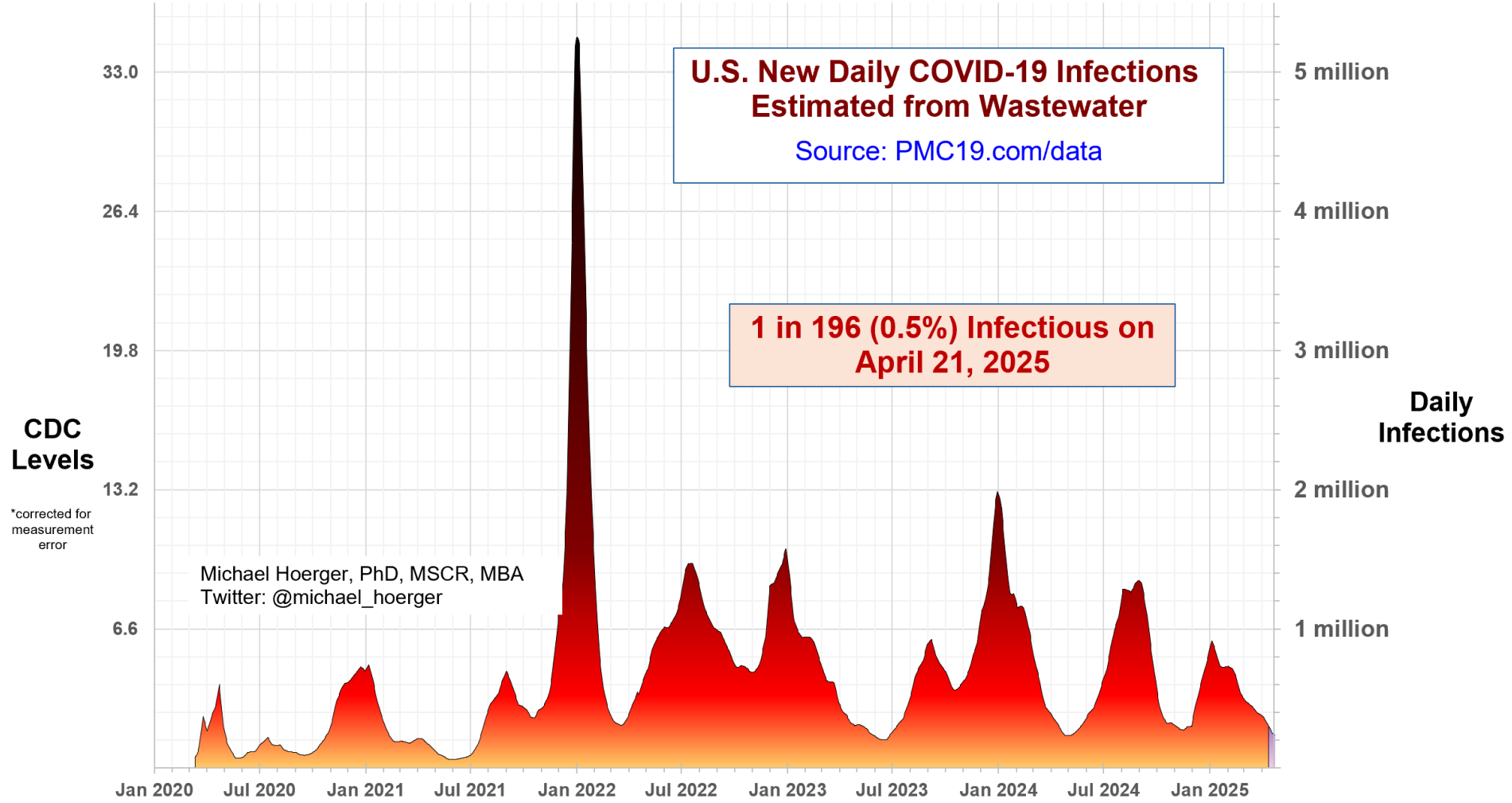
Announcements

Data Quality Note: We have some concerns about operational management issues at the CDC that may affect wastewater data quality and the cadence of PMC reports. The CDC (80% model weight) reported data this week, as did Biobot (20% model weight). Data quality is moderate to low. Biobot has reported consistently of late. However, the CDC has shown some operational concerns. Specific examples follow. One, on Friday, the CDC noted that its dashboard was updated as usual for a Friday, but in fact the data were not updated. Two, sometime between Friday and Saturday, an obscure CDC page showed the wastewater update, but for national numbers only and with several webpage layout errors. Three, on Friday, in response to our request that the CDC update their color scheme for the heat map to reflect that of PMC, Newsweek, or their own flu map, we received a response that appeared to be written entirely by AI; it is troubling to outsource geospatial analytic ethics to AI. Four, on Monday, the CDC updated the entire dashboard 3 days late; this is highly atypical and historically and delays would have been noted in advance on the website. Five, these issues are amid reporting of wastewater site closures (e.g., San Diego), other website quality issues, and the sizable cuts to CDC funding. As a reminder, PMC has backup plans for modeling if CDC problems become more substantial.

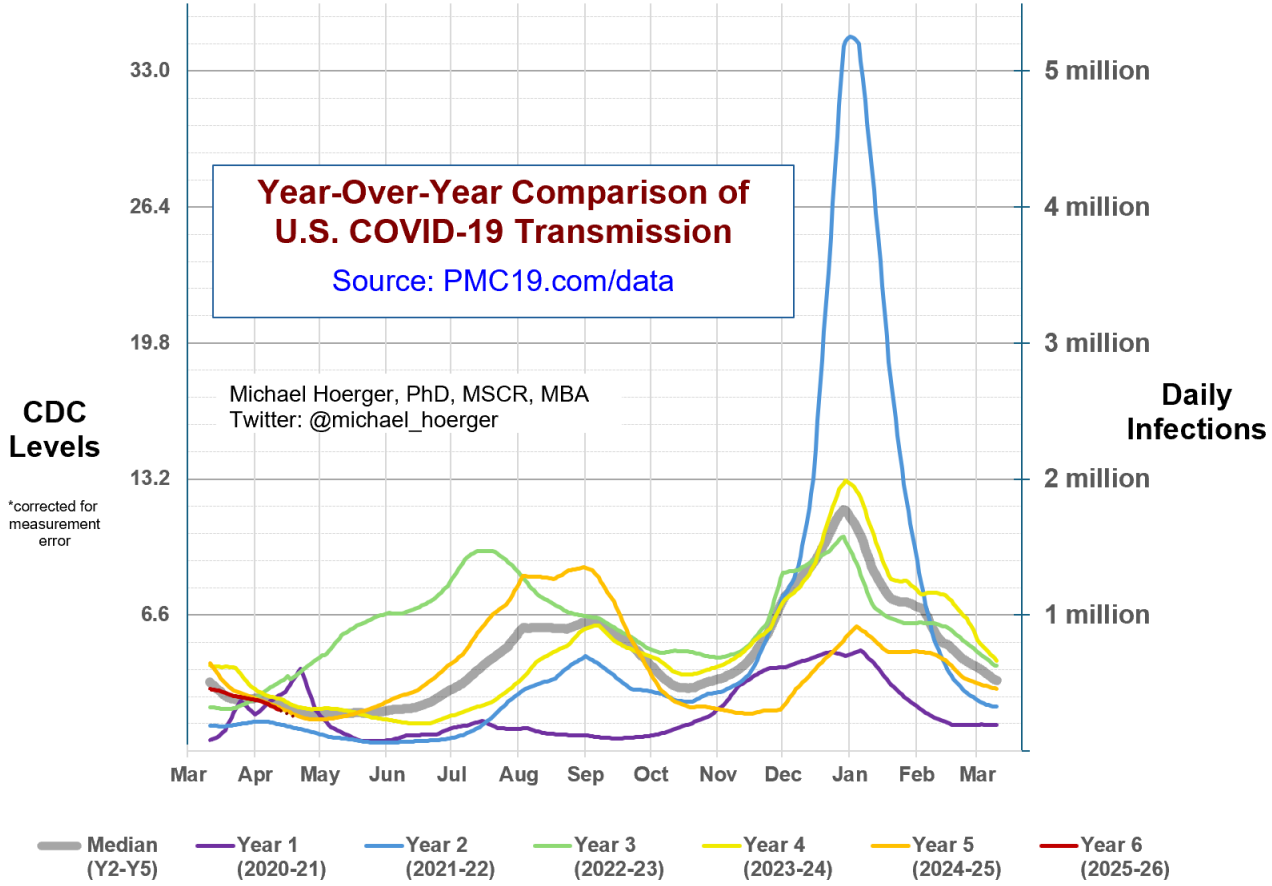
The Big-Picture View of the Pandemic

We are in a “lull” between Covid waves. Presently, an estimated 0.5% (1 in 196 people) are actively infectious. The national average for transmission may not get much lower for some time.



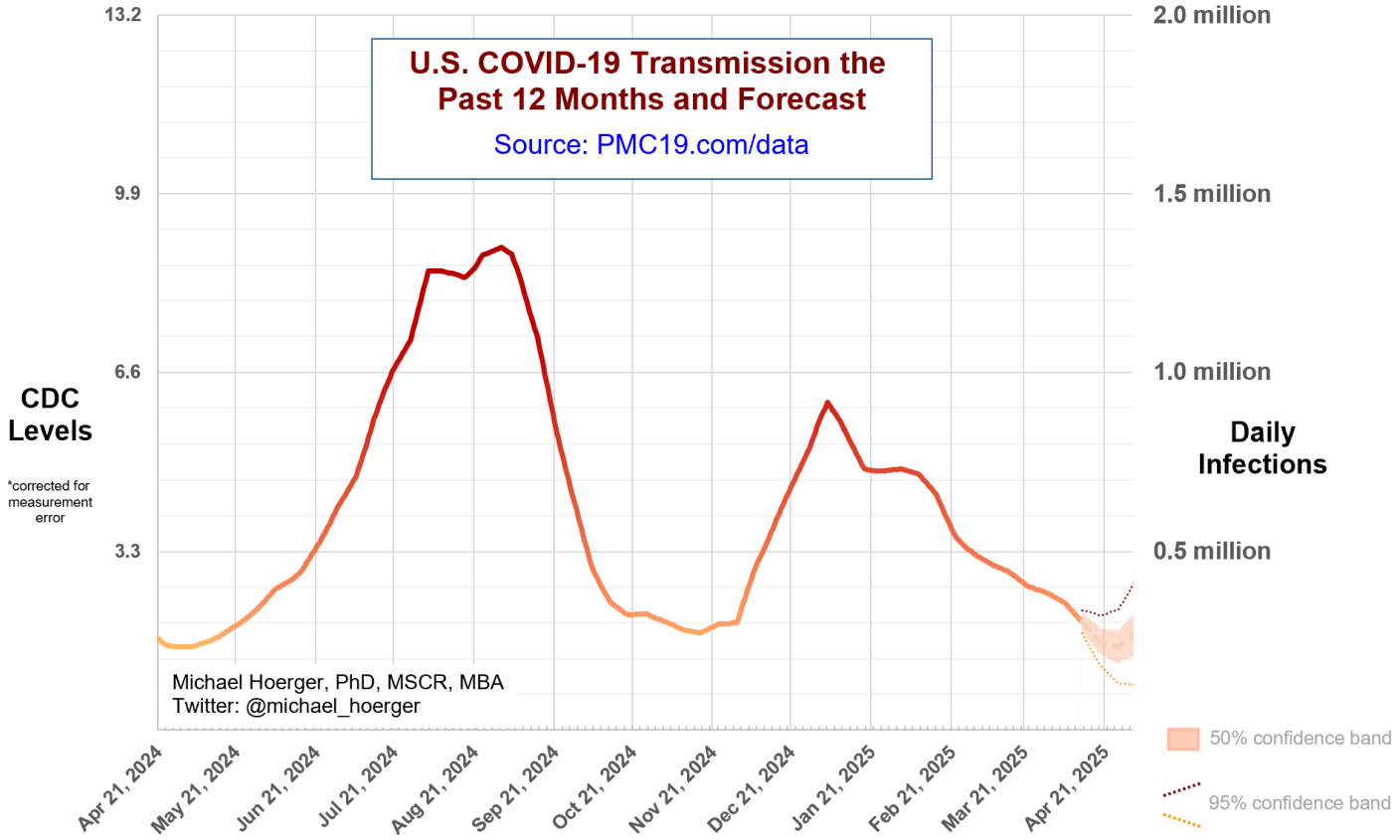
Year-Over-Year Comparisons

The year-over-year graph shows current transmission along the red line in the lower left corner. Note that transmission is tracking closely with median transmission (grey line), year 4 (yellow line), and year 5 (orange line). A reasonable default multi-month forecast would be to assume cautiously that we are on a trajectory similar to the median with the potential for transmission to pick up considerably between mid-June and early August with a peak of 0.9 to 1.4 million daily infections, basically somewhere between the yellow and orange scenarios. Local transmission may vary, and data to the contrary would override that default assumption. Know what is “typical” and monitor for something atypical.



Close-up on the Current Forecast

This graph shows the current forecast. Note that values for “today” are a forecast from data 9-12 days old. The current forecast is for steady transmission of 200,000-350,000 daily infections the next several weeks. Avoid overinterpreting the minor forecasted uptick on the right; looking back at the prior page, note that in several years, transmission bounces around this time of year at differences that are quite marginal in hindsight. The March/April spike WastewaterSCAN observed in the Northeast is subsiding, meaning the current data provide no evidence of any atypical increases in transmission on the horizon. With retroactive corrections and some very favorable data from Biobot, the forecast looks better than last week. We have narrowed the forecasted window given the data quality concerns noted at the start.



Supplemental Statistics

These supplemental statistics may prove useful in conversations about transmission and mitigation. In a large event of 50-60 people, there is a 1-in-4 chance of exposure if average risk and no firm testing/isolation policies. **The updated table now shows that the infections this week are anticipated to result in 600-1,000 excess deaths. The infections over the next month are expected to result in 3,500-5,800 excess deaths.**

Current Levels for Apr 21, 2025
% of the Population Infectious
0.5% (1 in 196)
New Daily Infections
244,000
New Weekly Infections
1,708,000
Resulting Weekly Long COVID Cases
85,000 to 342,000
Resulting Weekly Excess Deaths
600 to 1,000

Monthly Forecast
Average % of the Population Infectious
0.7% (1 in 147)
Average New Daily Infections
324,800
New Infections During the Next Month
9,744,000
Resulting Monthly Long COVID Cases
487,000 to 1,949,000
Resulting Monthly Excess Deaths
3,500 to 5,800

Running Totals
Infections Nationwide in 2025
62,331,000
Average Number of Infections Per Person All-Time, U.S.
3.77

How Does Risk Increase with More Social Contacts?

Number of People	Chances Anyone Is Infectious	Number of People	Chances Anyone Is Infectious
1	0.5%	15	7.4%
2	1.0%	20	9.7%
3	1.5%	25	12.0%
4	2.0%	30	14.2%
5	2.5%	35	16.4%
6	3.0%	40	18.5%
7	3.5%	50	22.6%
8	4.0%	75	31.9%
9	4.5%	100	40.1%
10	5.0%	300	78.5%

Assumes no testing/isolation protocols (U.S. only)
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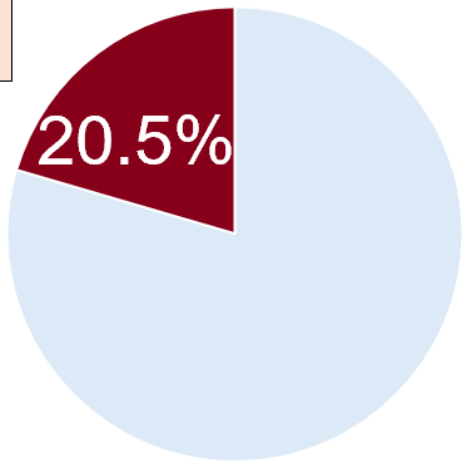
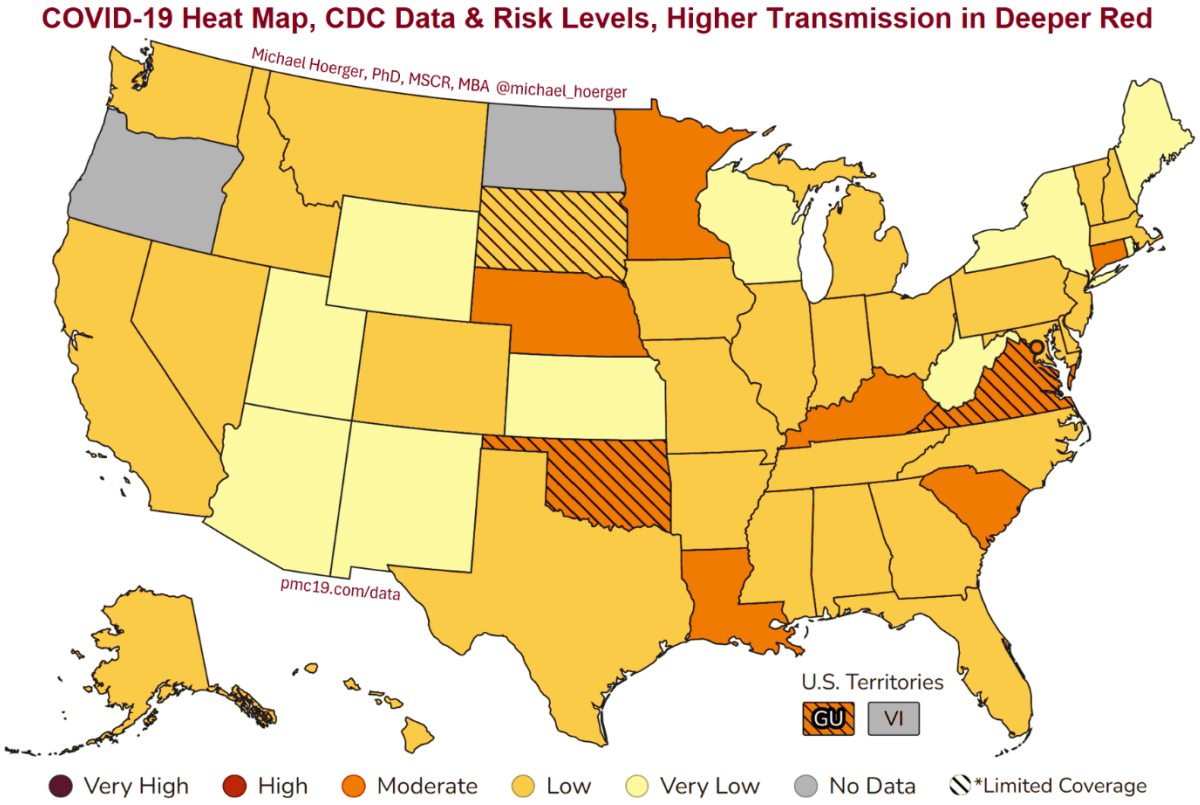


There is more COVID-19 transmission today than during 20.5% of the pandemic.

CDC COVID-19 Heat Map

This map uses the CDC state-by-state data to show areas with higher transmission in deeper red. The CDC version of the map, colored in cool blue is available online. Blue tends confuse people into thinking transmission is “cool” or low, so we and various popular media outlets (e.g., Newsweek) tend to recolor. The dashed lines indicate atypically low representation from the wastewater sites within a state.
https://www.cdc.gov/nwss/rv/COVID19-currentlevels.html

Note, the CDC came through with updated state-level data 3 days late, so we have updated the map relative to the “all missing data” map from Friday.

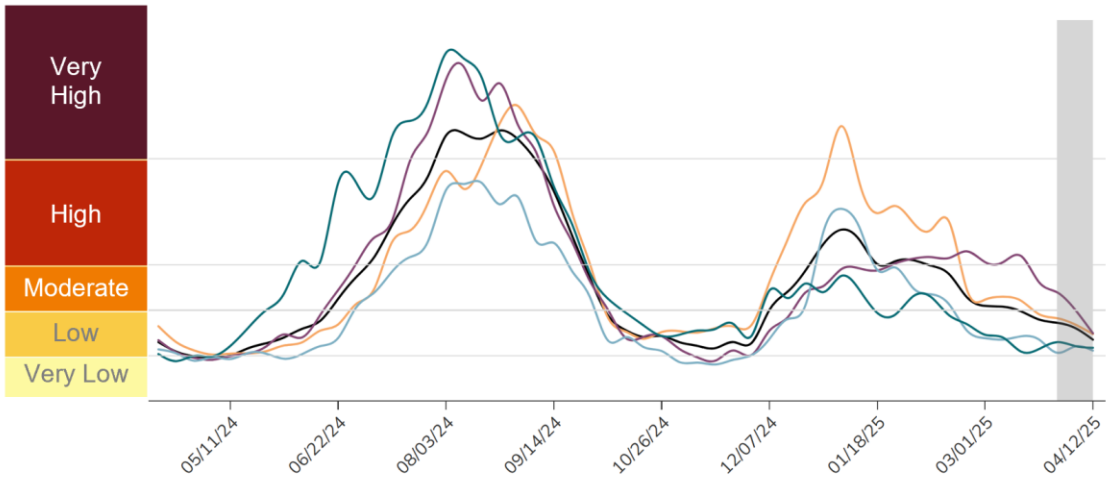


Regional Case Estimation

This graph from the CDC shows regional variation in transmission. You can use the “PMC Regional Multiplier” to get a ballpark estimate the proportion of a given region actively infectious with COVID-19 (see Technical Appendix document on the dashboard page).

The CDC regional data are available online:
https://www.cdc.gov/nwss/rv/COVID19-nationaltrend.html
State-level data are also available: https://www.cdc.gov/nwss/rv/COVID19-statetrend.html

CDC Regional Levels with PMC Estimates of the Percentage Actively Infectious



Estimated Percentage Actively Infectious*	PMC Model	Raw CDC Data
National	0.5% (1 in 196)	0.6% (1 in 155)
Northeast	0.5% (1 in 197)	0.6% (1 in 157)
Midwest	0.7% (1 in 153)	0.8% (1 in 121)
South	0.8% (1 in 118)	1.1% (1 in 94)
West	0.4% (1 in 240)	0.5% (1 in 190)

* The "Raw CDC" values are simply the value in the CDC chart multiplied by the PMC Regional Multiplier. The "PMC Model" estimates adjust those data by accounting for reporting time lag.

PMC Regional Multiplier*
0.317

* CDC level multiplied by the PMC Regional Multiplier provides an approximate estimate of the percentage actively infectious.

PMC COVID-19 Dashboard

Here is the complete PMC COVID-19 Dashboard. Please share the images across social media and other websites.
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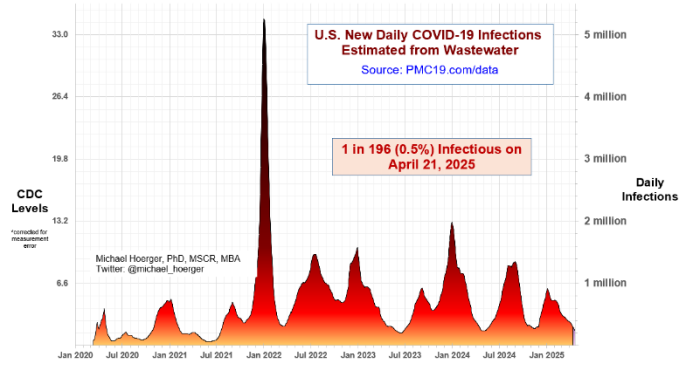

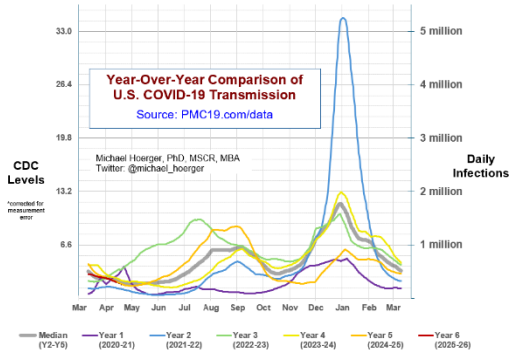

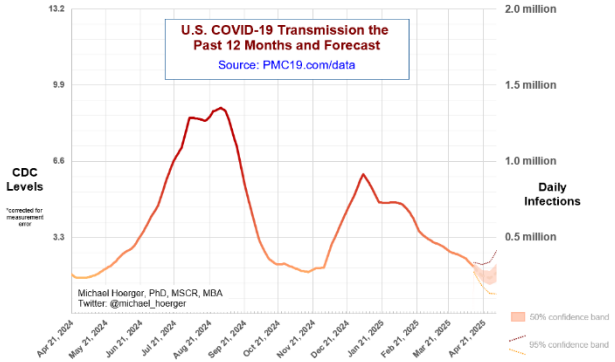

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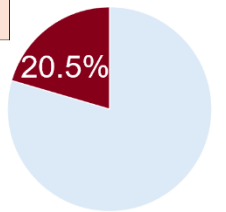

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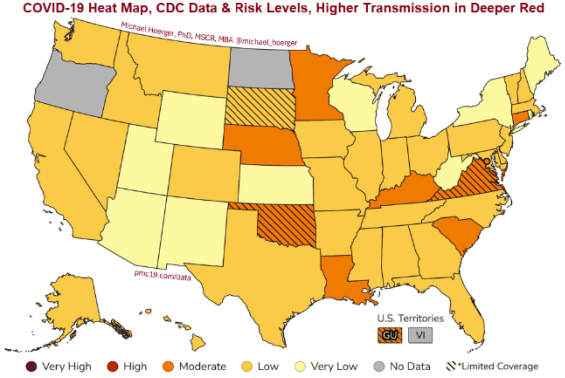
COVID-19 Heat Map, CDC Data & Risk Levels, Higher Transmission in Deeper Red



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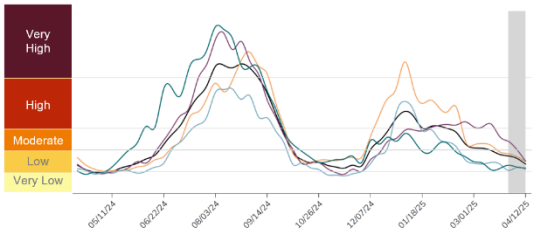

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A separate document called a Technical Appendix appears on the dashboard page and has more methodologic info.