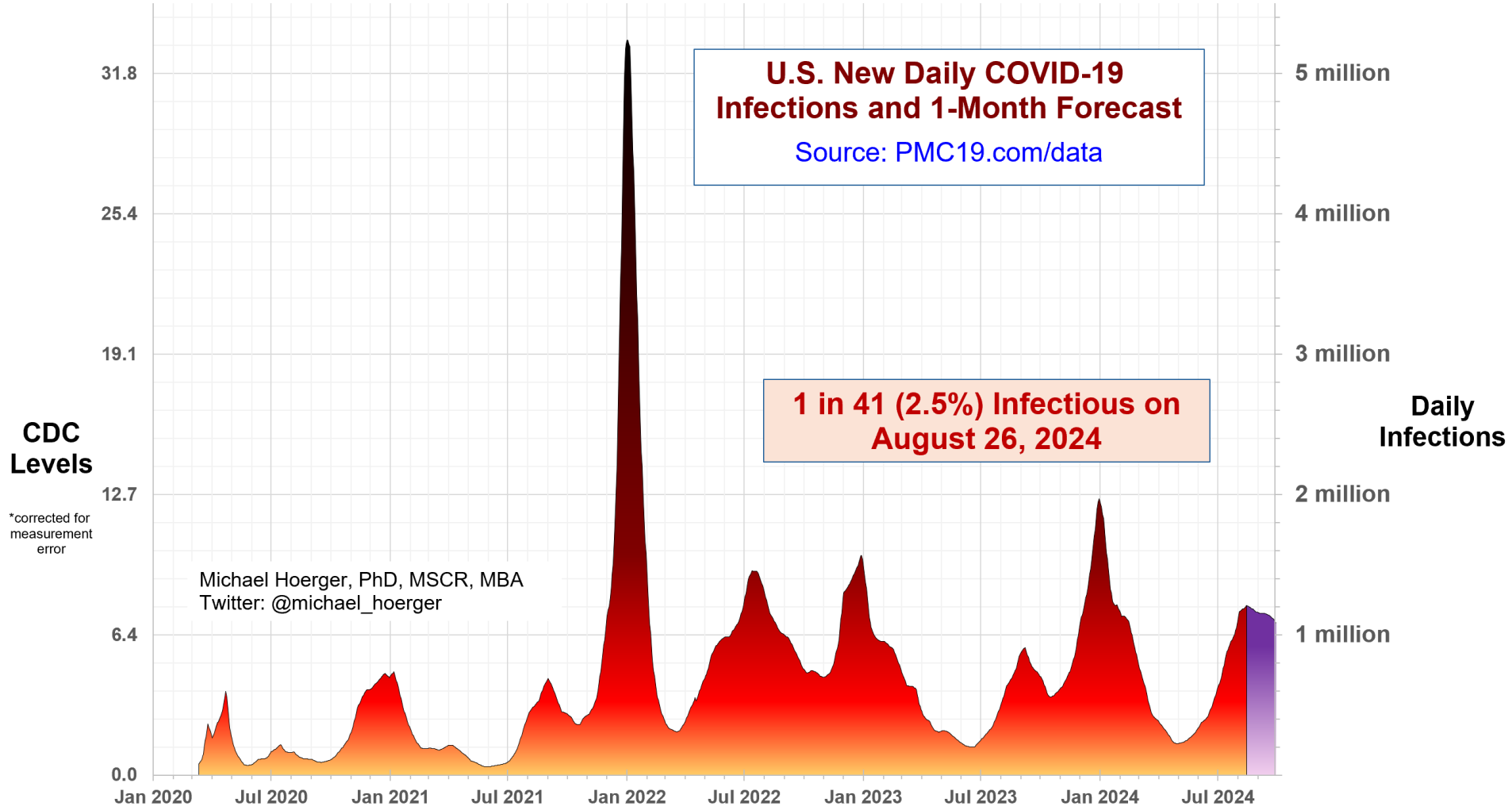
PMC U.S. COVID-19 Case Estimation and Forecasting Model: Report for August 26, 2024, pmc19.com/data

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



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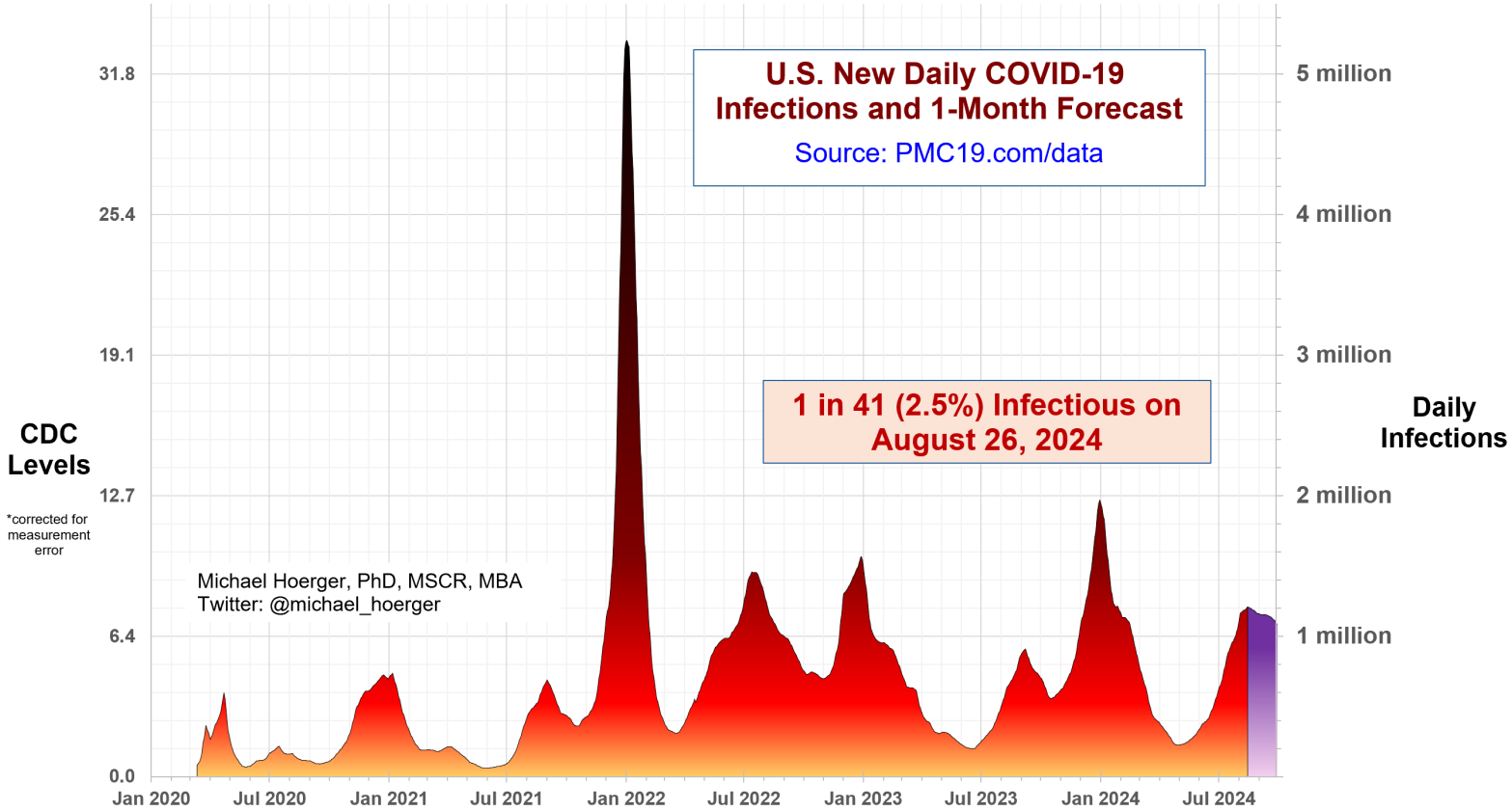
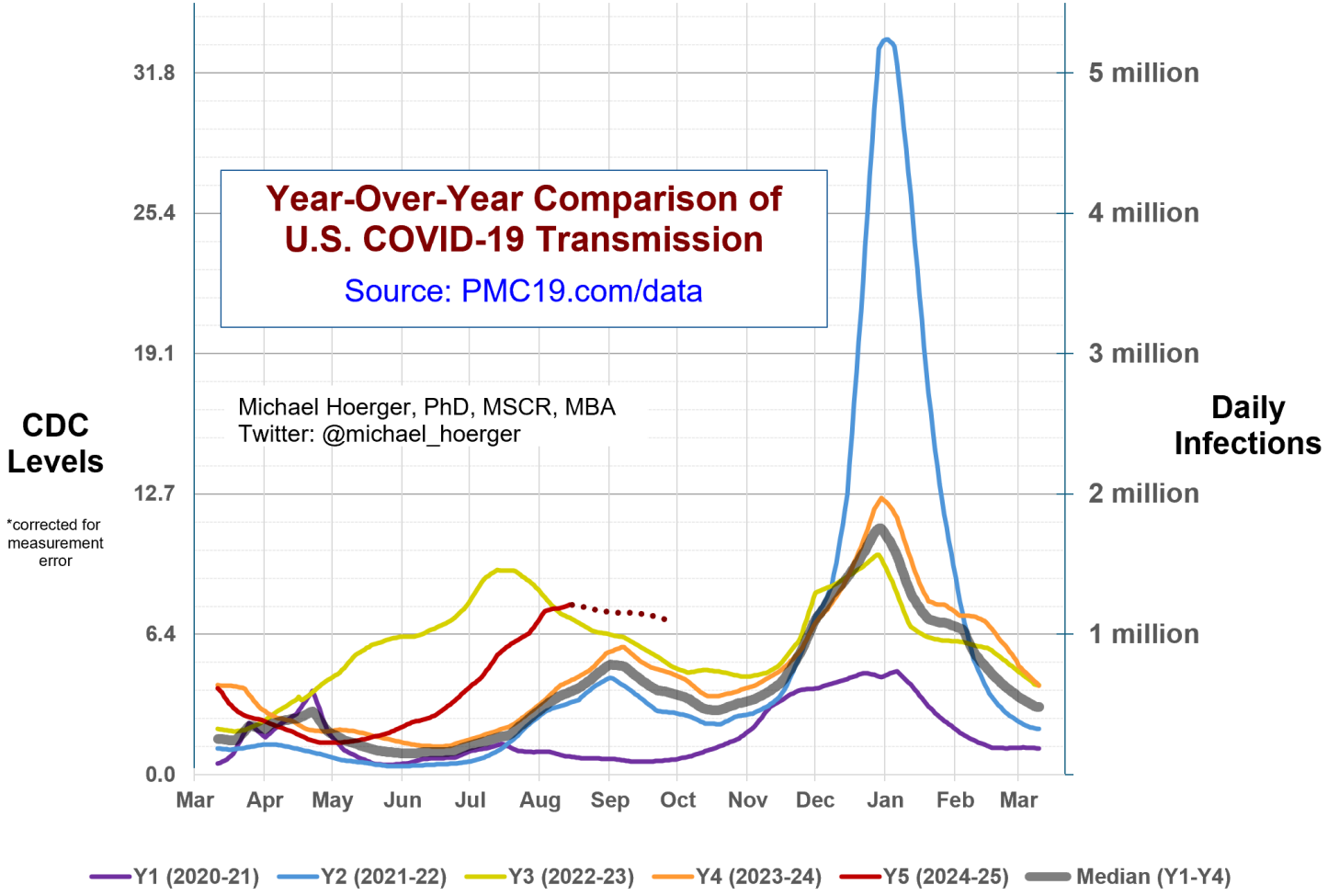
The Big-Picture View of the Pandemic

We are well into the 9th wave of the pandemic, with approximately 1.2 million infections per day. Approximately 2.5% of the U.S. population is actively infectious. Expect an average of approximately 1.1 million infections per day over the next month. Although we are likely peaking nationally, note the regional variation, with the South and West higher but likely past the peak, and the Midwest and Northeast likely lower and approaching the peak soon. When examining the CDC data, remember the real-time data are a week old, and we also weight Biobot (former CDC contractor) data into our model, which suggests a slightly later national peak than CDC. In recent waves, 50-60% of transmission occurs after the peak day, and we expect high transmission the remainder of 2024.



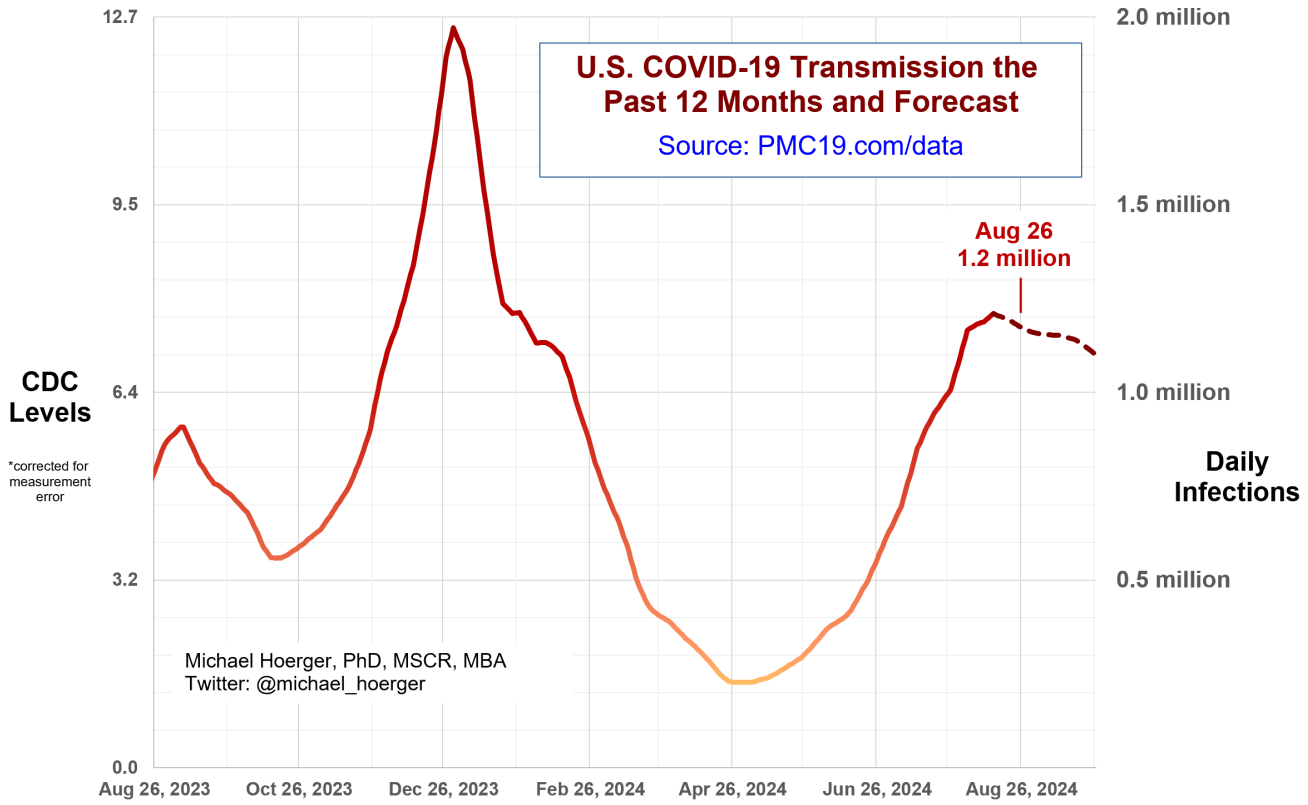
Year-Over-Year Comparisons

The year-over-year comparisons suggest that we are experiencing the highest-level of transmission all-time during the back-to-school period of August. The wave is both high and wide, meaning sustained high levels of transmission. Schools and businesses that lack multilayered mitigation (vaccines, masking, excellent indoor air quality, better-than-CDC isolation guidance, testing) should expect illness and absences.



Close-up on the Current Forecast

This is our most granular graph of the current wave. We are at an estimated 1.2 million current infections per day in the U.S. The forecast is for a more platykurtic wave (wide, rather than spiky) relative to prior waves. That could change in hindsight through CDC and Biobot retroactive corrections, meaning a consolidation of transmission toward an earlier, taller spike. Biobot did not provide their weekly report on Wednesday, so we are modeling from current CDC data but Biobot data that is a bit stale, unfortunately. If the wave shape is reasonably accurate, which we believe is correct, it likely represents a lot of very high transmission with substantial geographic variability that is creating a longer spread around the national average for the peak. If there were less geographic variability, the wave would look a bit more like a spikier (leptokurtic) winter wave.



Supplemental Statistics

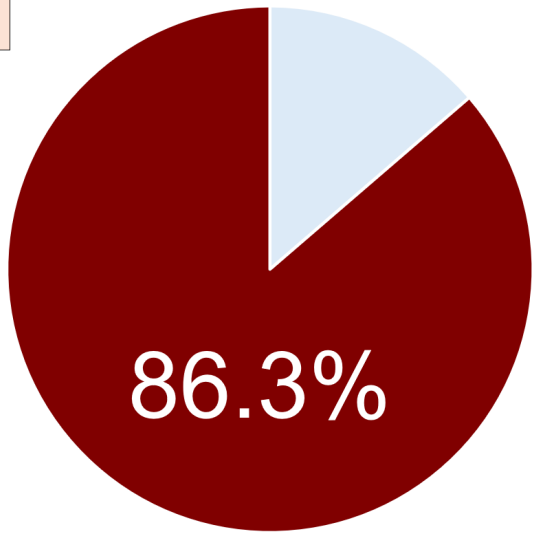
These supplemental statistics may prove useful in conversations about transmission and mitigation. To highlight a few, 1 in 41 people are actively infectious, with nearly 1.2 million infections/day. Over the next month, expect about 1.1 million infections/day on average. In a school classroom of 25-30 people, it should be assumed that someone (about a 50% chance) has infectious COVID. Transmission is higher than during 86.3% of the pandemic, lower than just 13.7% of pandemic days. The impact on potential Long COVID cases the next month will be staggering, and expect high transmission throughout the remainder of 2024.

Current Levels for Aug 26, 2024
% of the Population Infectious
2.5% (1 in 41)
New Daily Infections
1,173,000
New Weekly Infections
8,211,000
Resulting Weekly Long COVID Cases
411,000 to 1,642,000

Monthly Forecast
Average % of the Population Infectious
2.4% (1 in 42)
Average New Daily Infections
1,148,067
New Infections During the Next Month
34,442,000
Resulting Monthly Long COVID Cases
1,722,000 to 6,888,000

Running Totals
Infections Nationwide in 2024
180,090,000
Average Number of Infections Per Person All-Time, U.S.
3.32

How Does Risk Increase with More Social Contacts?			
Number of People	Chances Anyone Is Infectious	Number of People	Chances Anyone Is Infectious
1	2.5%	15	31.1%
2	4.8%	20	39.2%
3	7.2%	25	46.3%
4	9.5%	30	52.5%
5	11.7%	35	58.1%
6	13.9%	40	63.0%
7	16.0%	50	71.1%
8	18.0%	75	84.5%
9	20.0%	100	91.7%
10	22.0%	300	99.9%



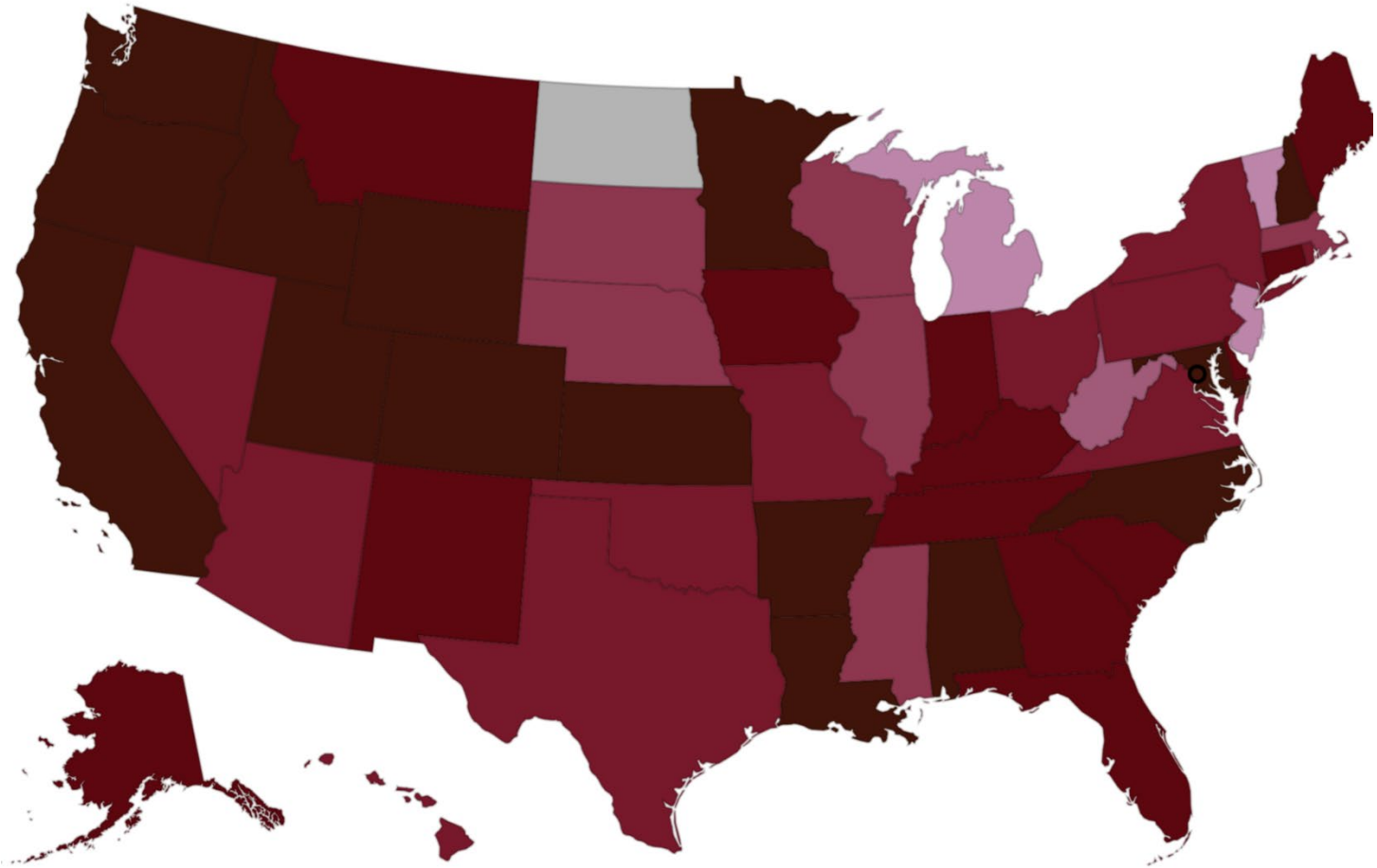
There is more COVID-19 transmission today than during 86.3% of the pandemic.

Michael Hoerger, PhD, MSCR, MBA
Twitter: @michael_hoerger

CDC COVID-19 Heat Map

This map uses the CDC state-by-state data to show areas with higher transmission in deeper red. Much of the U.S., especially the West and South have extremely high transmission. The CDC version of the map, colored in cool blue is available online: https://www.cdc.gov/nwss/rv/COVID19-currentlevels.html

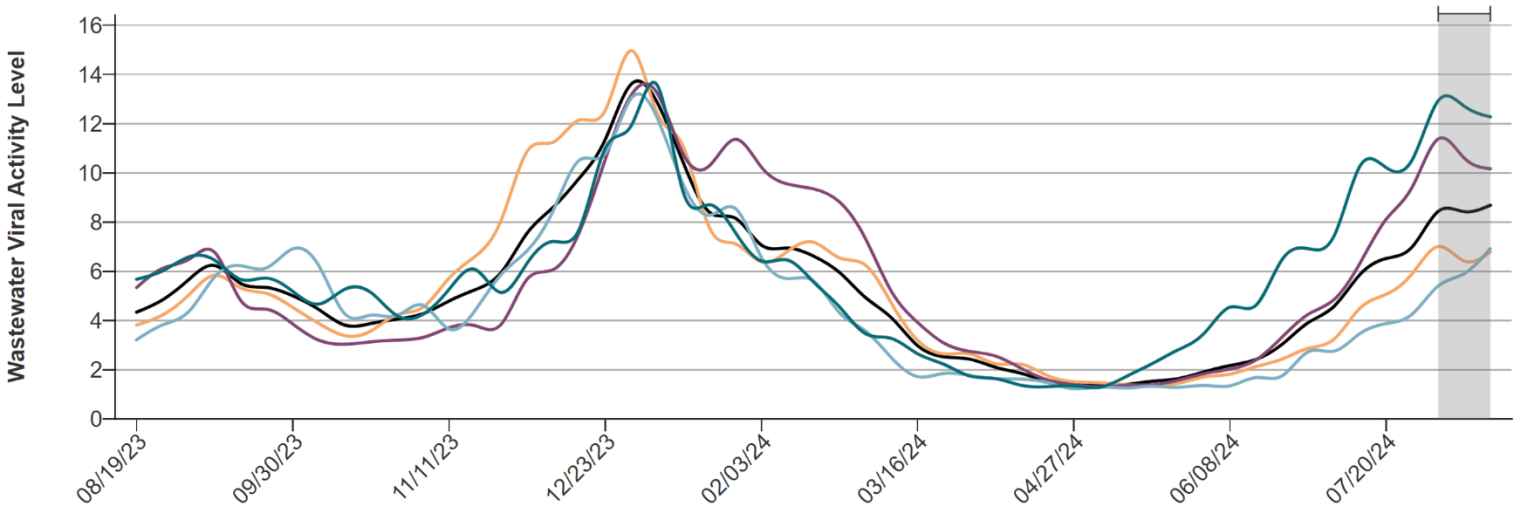
CDC COVID-19 Heat Map, Higher Transmission Shown with Deeper Red



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	2.5% (1 in 41)	2.9% (1 in 35)
Northeast	2.0% (1 in 51)	2.3% (1 in 44)
Midwest	1.9% (1 in 52)	2.2% (1 in 45)
South	2.9% (1 in 35)	3.3% (1 in 30)
West	3.5% (1 in 29)	4.0% (1 in 25)

* The "Raw CDC" values are simply the value in the CDC chart multiplied by the PMC Regional Multiplier. The "PMC Model" estimates adjust thosedata by accounting for reporting time lag and to a marginal degree whether Biobot data suggest higher or lower transmission levels.

PMC Regional Multiplier*
0.329

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

Example of the PMC Multiplier Using the "Worst" States for Transmission

We will not report this every week, but here is an example of how to use the PMC Multiplier. Find the geographic entity of interest on the CDC website using the links from the previous page. Find the current level. Multiply that by the PMC Multiplier, and one will get an estimate of the percent of that population actively infectious. This is the best point estimate we can provide readily. The estimate has three key limitations. One, the CDC data run about a week old (a little more than that as of today). Two, assume a broader confidence interval for the estimate if there are fewer sites within an entity or they have only recently launched. Three, standardizing wastewater data as the CDC does is a niche area of science, and we are willing to assume that the top scientists working on these data can standardize the data with high enough quality to allow regional comparisons, but in general take the estimates with a grain of salt, especially when considering smaller and smaller geographic units.

State	CDC Level	Percent Infectious	Sites Reporting
Oregon	23.82	7.8% (1 in 13)	28
Minnesota	15.95	5.2% (1 in 19)	33
Washington, D.C.	15.68	5.2% (1 in 19)	1
Arkansas	15.66	5.2% (1 in 19)	8
Idaho	14.76	4.9% (1 in 21)	3
New Hampshire	14.63	4.8% (1 in 21)	11
North Carolina	13.64	4.5% (1 in 22)	33
Washington (state)	13.23	4.4% (1 in 23)	29
Alabama	12.86	4.2% (1 in 24)	7
Colorado	12.52	4.1% (1 in 24)	23
California	12.43	4.1% (1 in 24)	42
Maryland	12.19	4.0% (1 in 25)	10
Wyoming	12.16	4.0% (1 in 25)	2
Louisiana	12.02	4.0% (1 in 25)	50
Utah	11.78	3.9% (1 in 26)	33
Kansas	11.08	3.6% (1 in 27)	13

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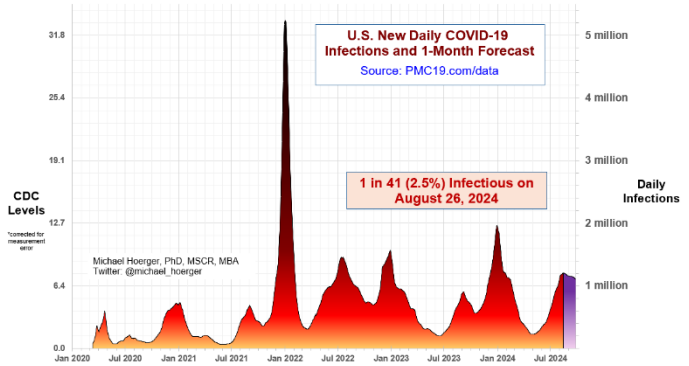
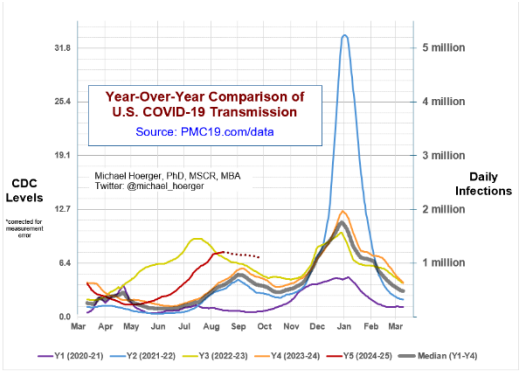
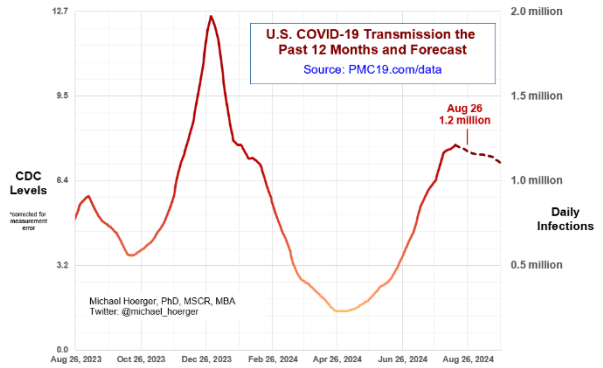
PMC COVID-19 Dashboard

Here is the complete PMC COVID-19 Dashboard. Please share the images across social media and other websites.
Michael Hoerger, PhD, MSCR, MBA | Pandemic Mitigation Collaborative | pmc19.com/data







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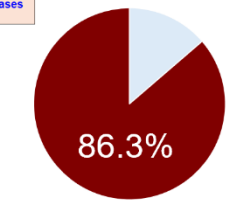
pmc19.com/data Michael Hoerger, PhD, MSCR, MBA Twitter: @michael_hoerger



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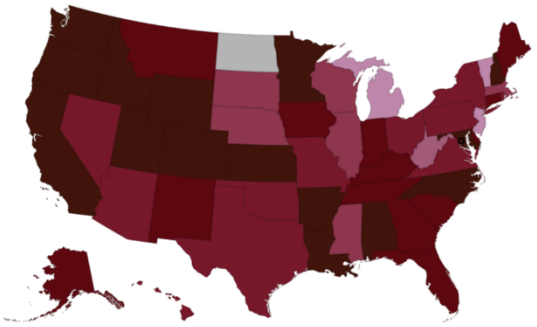

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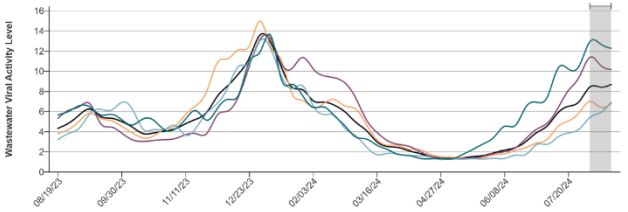

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Announcements

July 11
Recent COVID chat on Twitter had >2,000 listeners:
https://x.com/AnciraBecky/status/1808429122831401145

July 24
TODAY covers the PMC Forecast for the summer wave:
https://www.today.com/health/coronavirus/states-with-highest-covid-rates-2024-rcna163403

Aug 1
Check out our new empirical article in JAMA-NO framing masking in healthcare as a healthcare quality indicator.
Article: https://jamanetwork.com/journals/jamanetworkopen/article-abstract/2821699
Summary: https://www.msn.com/en-gb/health/other/masking-policies-prevalent-in-top-cancer-centers-amid-winter-covid-wave/ar-BB1qZWnr
Twitter Spaces Conversation: https://x.com/i/spaces/1OdKrXllryAJX
*If new to Twitter, it is not terribly challenging to create an account. Do so, and check in once a month or so. You may find it more useful than realized. I did.
PPT for the Space: https://pmc19.com/jama.pdf

Aug 15
The dashboard and a related pilot project were featured on CBS 4WWL.
https://www.wwltv.com/article/news/health/new-orleans-free-home-air-filters-for-cancer-patients-covid-cases-special-kit-safe/289-5d873151-7069-478a-ab03-2260cd08c22a

Sep 17
Pencil in a Data Discussion between Drs. Hoerger and Moriarty who run the top public COVID case estimation models in the U.S. and Canada, respectively. The tentative time is 8-10 PM ET (7-9 PM CT). More details to follow.

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