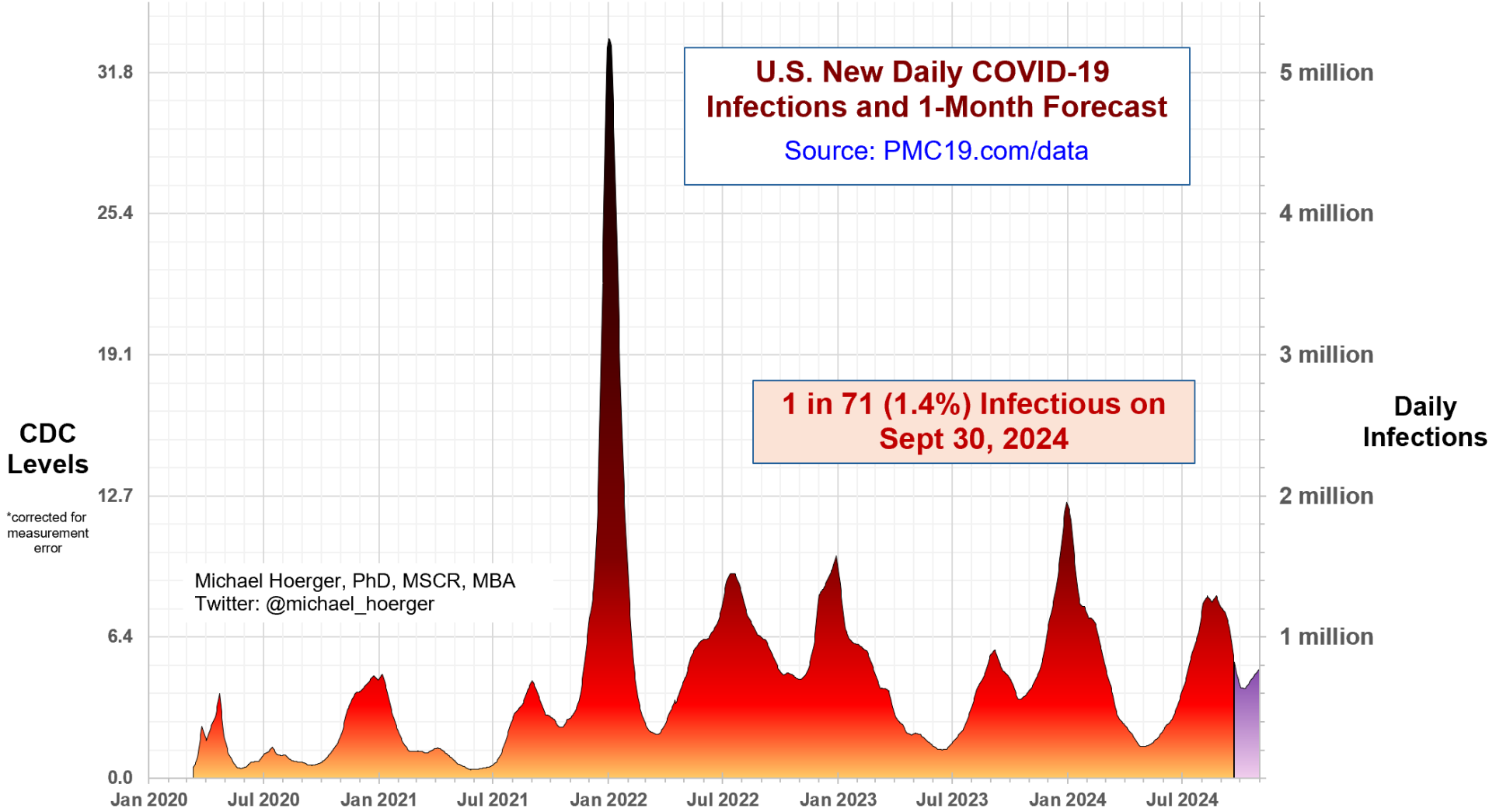
PMC U.S. COVID-19 Case Estimation and Forecasting Model: Report for September 30, 2024, pmc19.com/data

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



Cite as: Hoerger, M. (2024, Sep 30). *PMC U.S. COVID-19 Case Estimation and Forecasting Model: Report for September 30, 2024*. Pandemic Mitigation Collaborative. http://www.pmc19.com/data

Join the Team!

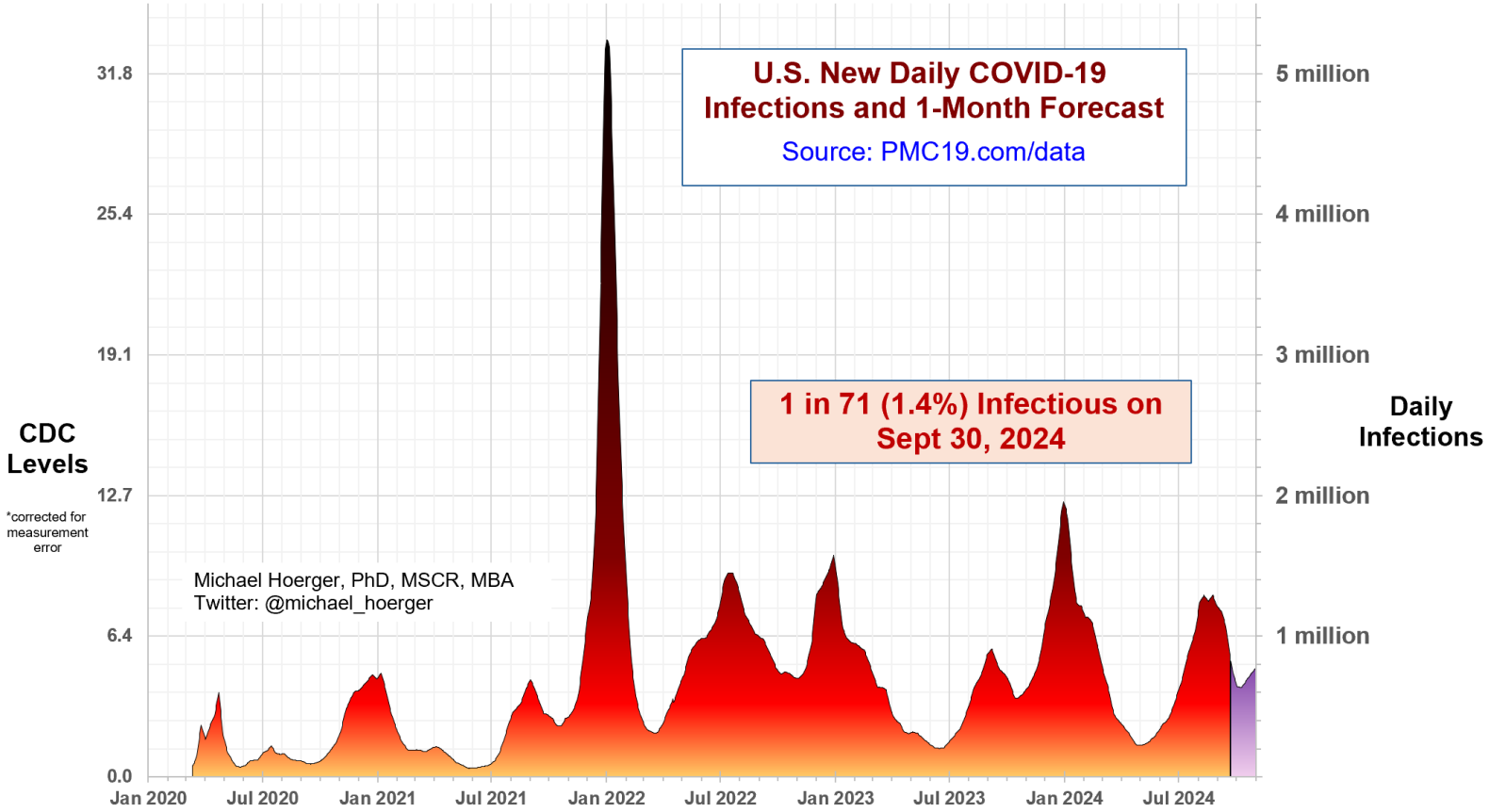
Dr. Hoerger is accepting students for the Health Psychology PhD program at Tulane University. Applications are due November 30. Please share the graphic below on listservs and social media.

Websites of relevance:

- Hoerger – psychmike.com
- Cancer Research – psych-onc.com
- Pandemic Program – pmc19.com
- Doctoral Program – HealthPsychPhD.com

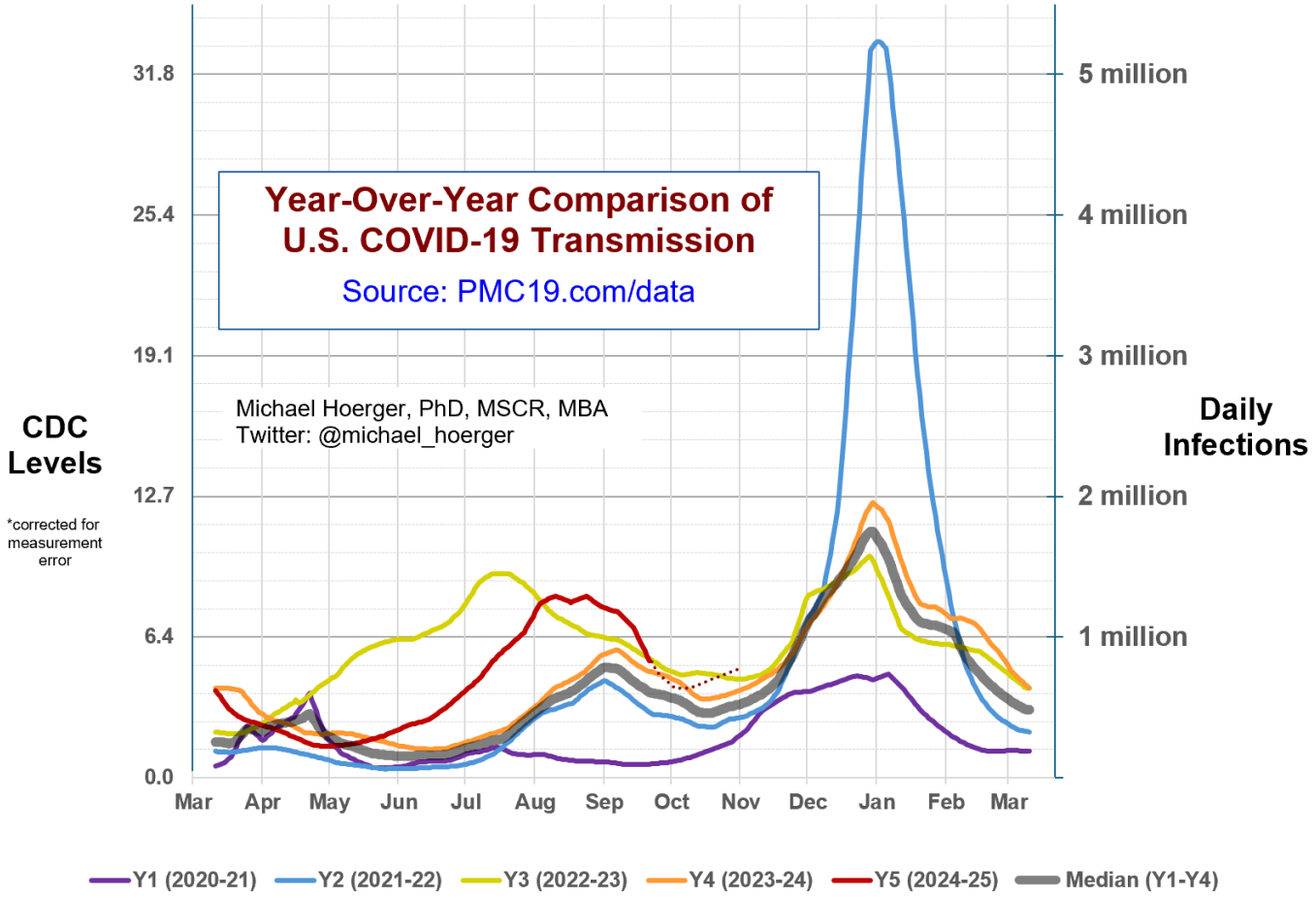
The Big-Picture View of the Pandemic

We are coming down from the 9th wave of the pandemic, which peaked at 1.3 million infections per day, and are heading soon into a 10th wave of COVID. As noted on pg. 5, the CDC made a significant downward retroactive correction to last week's reported numbers, and this week, there was an unprecedencted decline in transmission. If those numbers hold, we are looking at a wider and more favorable "lull" that previously reported, while transmission may hover around 650-900 thousand daily infections the next month. We expect high transmission the remainder of 2024.



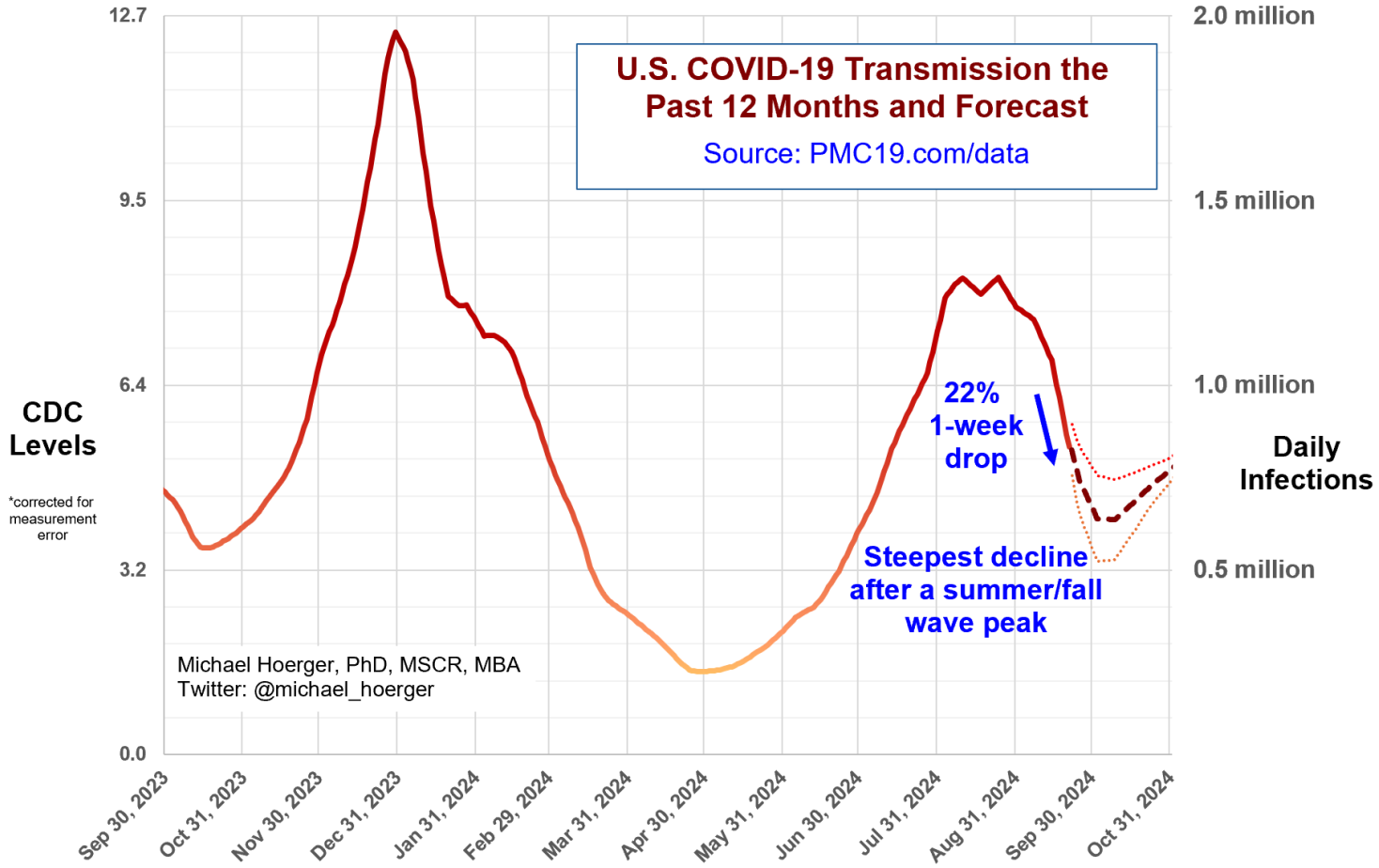
Year-Over-Year Comparisons

The year-over-year comparisons illustrate the unprecedented decline in transmission for the back end of summer/fall wave. If the numbers hold, October may look more similar to the past two years, as opposed to new highs, as previously anticipated.



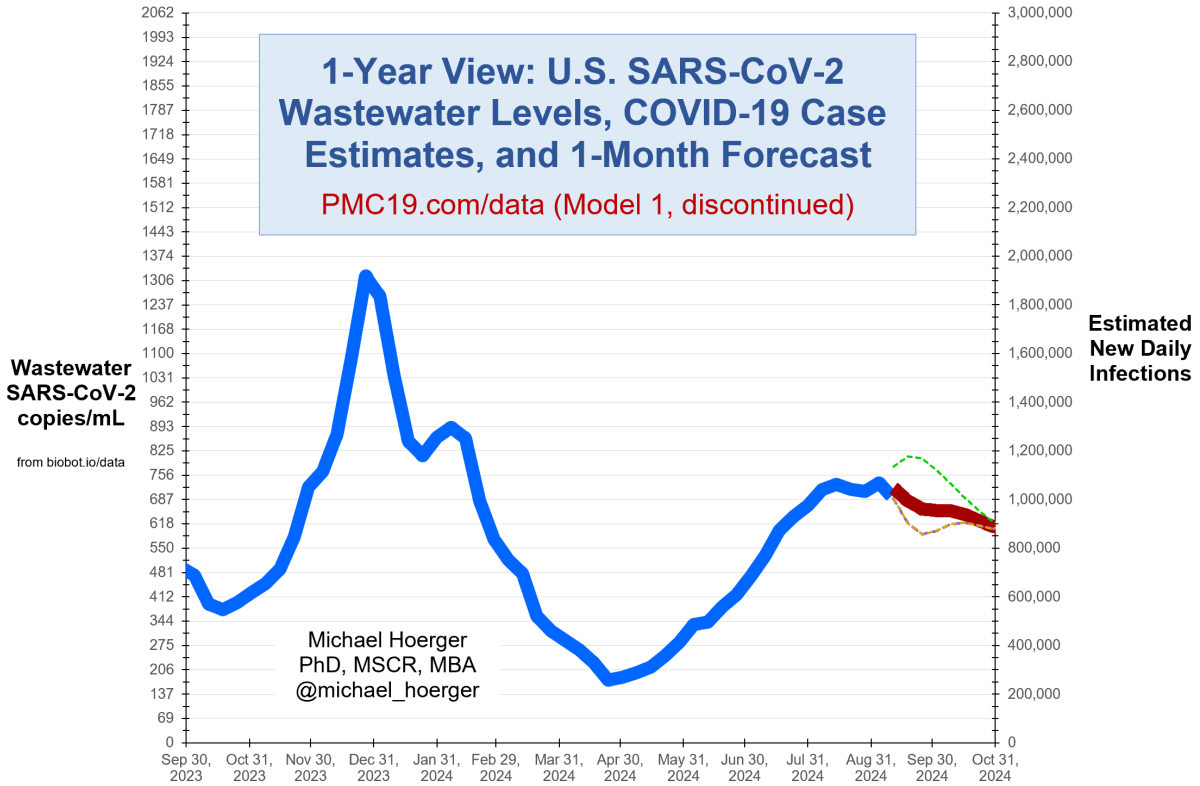
Close-up on the Current Forecast

Note the departure from last week's forecast. We had anticipated the low point between waves to occur around Nov 1 at roughly 850,000 daily infections. However, the CDC retroactively corrected last week's numbers downward by 6% (the average error is about 5%, and 95% of errors are within 8.33%), so this is on the high end. What's more extreme is the reported decline in transmission in this week's numbers, a 22% 1-week drop. If correct, that's the largest decline in transmission ever following the peak of a summer or fall wave. Essentially, we are in uncharted territory. Several hypotheses follow, next page.



Hypotheses on the unprecedented decline in transmission:

1) Reporting Error: The 22% decline could be driven in part by errors in real-time reporting. These average is 5%, based on our analyses of Biobot wastewater data. We do not have long-term data on the accuracy of Verily/CDC real-time reports versus retrospectively corrected values. In the updated graphic (previous page), we have added 95% confidence intervals for the real-time values based on Biobot data, which show that 95% of real-time errors fall within 8.33%. Note that the dotted lines do not show 95% confidence intervals for the forecast, merely how the best estimates would change if a large error in the real-time reports of +/- 8.33%. It's possible that next week the data will get corrected upward, and the forecast will more resemble the top dashed line. Below, we show the forecast for our old (Biobot-based model); it's still showing a slower decline, but they update their data about 5 days slower than the CDC, so it is unclear whether it's a big real-time reporting error at the CDC or just that the CDC is ahead of the game.



2) Unprecedented School Transmission: This is the largest wave during the August back-to-school period. It's possible transmission disproportionately affected school children and their families, and in being more targeted than typical transmission, the wave went down faster that what is normative thus far in the pandemic.

3) Laissez Faire Public Health: Public health guidance has weakened (e.g., 1-day isolation policy, not strongly pushing additional mitigation), which likely pushed the peak of the 9th wave higher, which could have led to a faster-than-usual resolution. The model accounts for these changing dynamics reasonably well, but with the school issue noted in hypothesis #2, it is possible the weakened public health guidance disproportionately hit a subset of the population, which altered the back side of the wave.

4) Missing Data: There are no widespread state-level instances of missing data, as is often the case. It is possible that specific areas did not report this week, and if there is a bias toward higher transmission in those places, the numbers will get retroactively corrected upward. This is one example of the issues that contribute to #1.

5) Politics: There is no evidence to suggest the CDC is modifying transmission data for political reasons. We put deep trust in the fundamental scientists doing the critical work translating wastewater into meaningful downloadable data. The inferences, agency graphs, and guidance can be influenced by politics, but the data are sound, given the limitations noted under #1.

Overall, if the data hold or anything reasonable within the ballpark, which is likely, this means a more prolonged and slightly lower lull than previously anticipated. Those putting off medical appointments and other risky activities may see this as a slightly broader window (today through Nov 7) to get things done. Note that even under the most optimistic forecasting scenarios, transmission remains very high in absolute terms, even if low in relative terms.

Supplemental Statistics

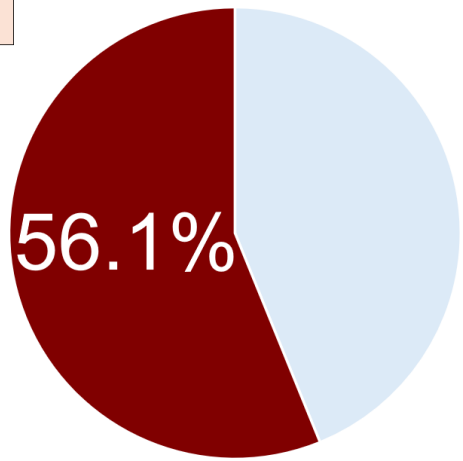
These supplemental statistics may prove useful in conversations about transmission and mitigation. The numbers are much lower than last week. We see that 1 in 71 are actively infectious, if the most recent numbers hold. Over the next month, expect about 700,000 infections/day on average, if the numbers hold. In a university classroom of 50 people, it should be assumed that someone (about a 50% chance) has infectious COVID. Transmission is higher than during 56% of the pandemic, lower than just 44% 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 Sep 30, 2024
% of the Population Infectious
1.4% (1 in 71)
New Daily Infections
669,000
New Weekly Infections
4,683,000
Resulting Weekly Long COVID Cases
234,000 to 937,000

Monthly Forecast
Average % of the Population Infectious
1.4% (1 in 70)
Average New Daily Infections
682,733
New Infections During the Next Month
20,482,000
Resulting Monthly Long COVID Cases
1,024,000 to 4,096,000

Running Totals
Infections Nationwide in 2024
217,437,000
Average Number of Infections Per Person All-Time, U.S.
3.43

How Does Risk Increase with More Social Contacts?			
Number of People	Chances Anyone Is Infectious	Number of People	Chances Anyone Is Infectious
1	1.4%	15	19.1%
2	2.8%	20	24.6%
3	4.1%	25	29.7%
4	5.5%	30	34.5%
5	6.8%	35	38.9%
6	8.1%	40	43.1%
7	9.4%	50	50.6%
8	10.7%	75	65.3%
9	11.9%	100	75.6%
10	13.1%	300	98.5%



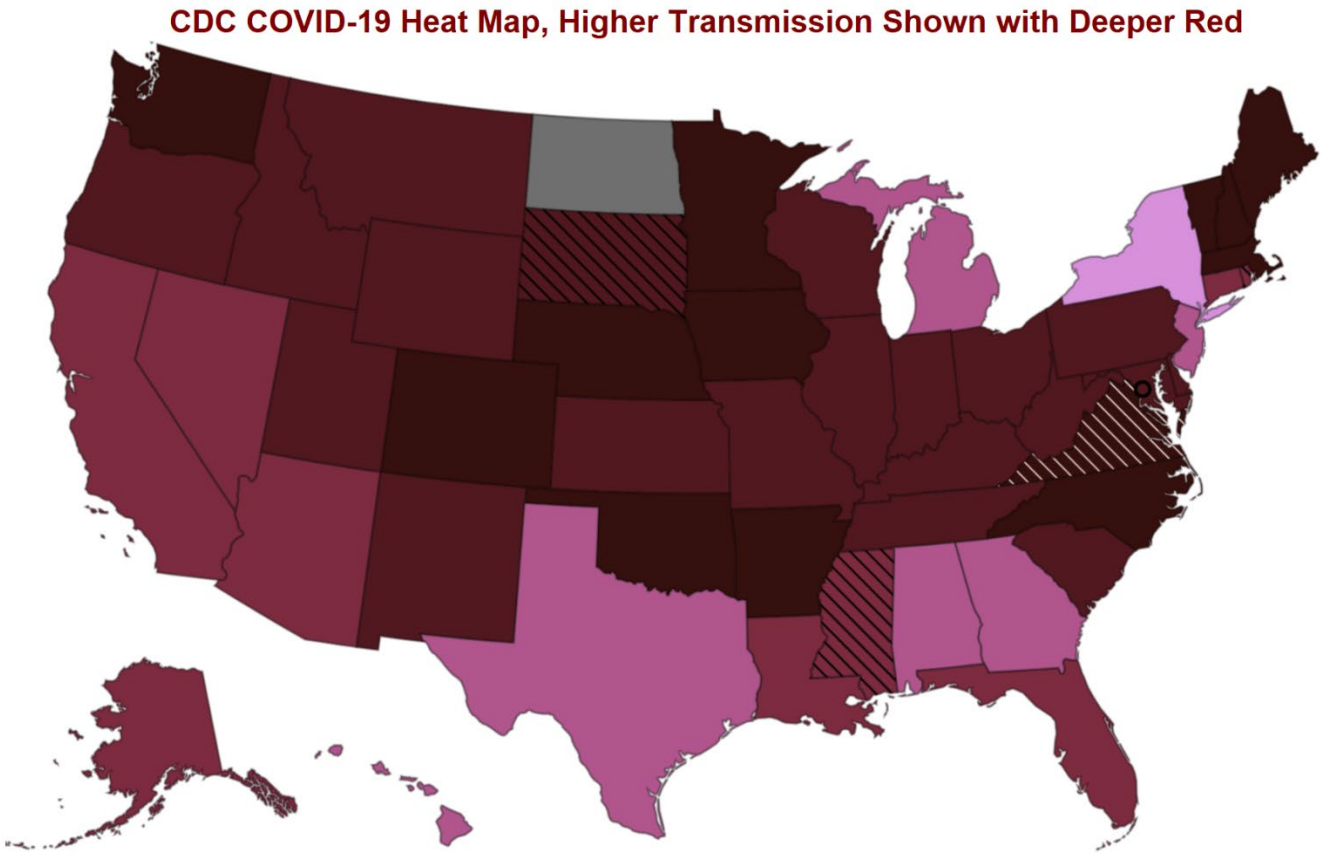
There is more COVID-19 transmission today than during 56.1% of the pandemic.

pmc19.com/data

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

CDC COVID-19 Heat Map

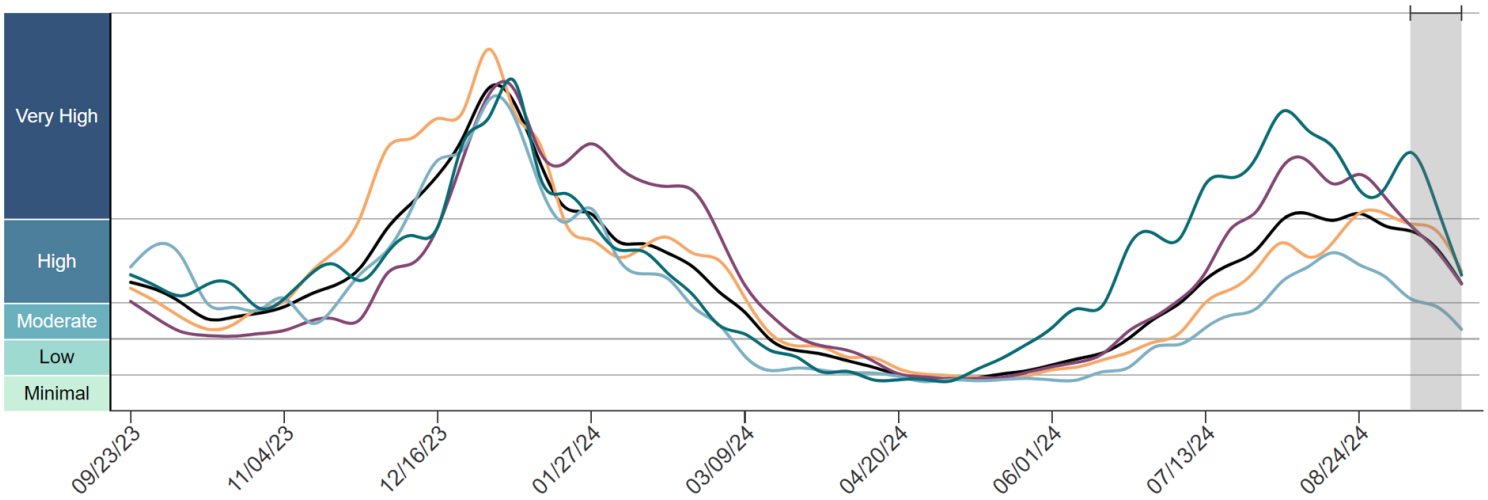
This map uses the CDC state-by-state data to show areas with higher transmission in deeper red. Notice the considerable geographic variation. The CDC version of the map, colored in cool blue is available online. They recently switched from an 11-shade to 6-shade map, both blue, which tends confused people into thinking transmission is “cool” or low: https://www.cdc.gov/nwss/rv/COVID19-currentlevels.html



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	1.4% (1 in 71)	1.7% (1 in 57)
	Northeast	0.9% (1 in 112)	1.1% (1 in 90)
	Midwest	1.5% (1 in 65)	1.9% (1 in 52)
	South	1.4% (1 in 72)	1.7% (1 in 58)
	West	1.5% (1 in 67)	1.9% (1 in 54)

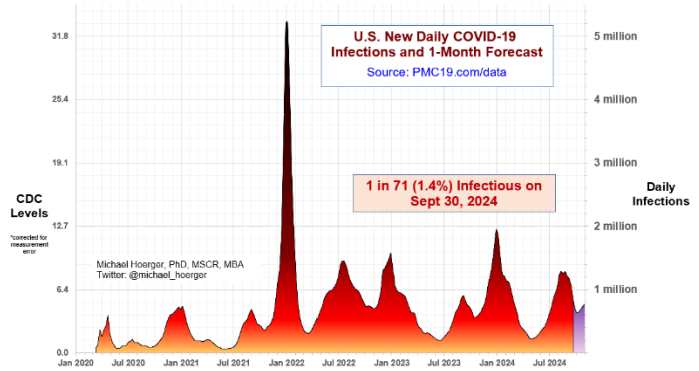
* The "Raw CDC" values are simply the value in the CDC chart multiplied by the PMC Regional Multiplier. The "PMC Model" estimates adjust those data by accounting for reporting time lag.

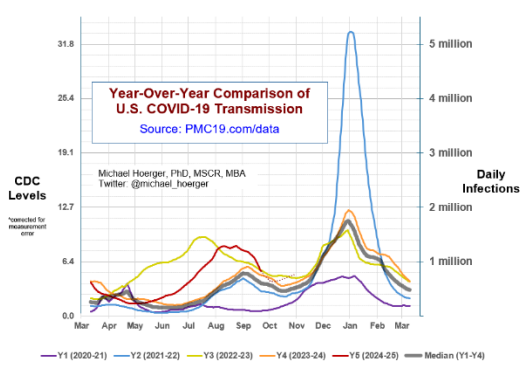
PMC Regional Multiplier*
0.329

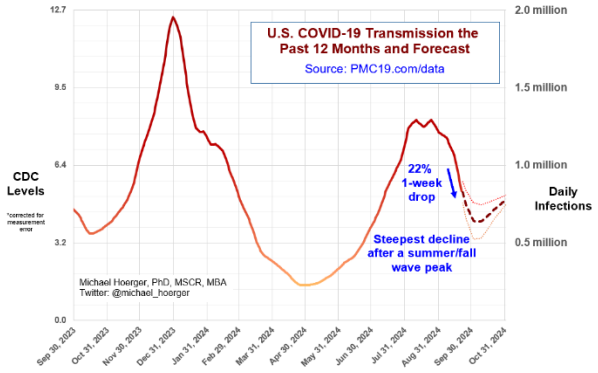
* CDC level multiplied by the PMC Regional Multiplier provides an approximate estimate of the percentage actively infectious.

PMC COVID-19 Dashboard

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







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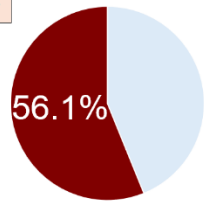

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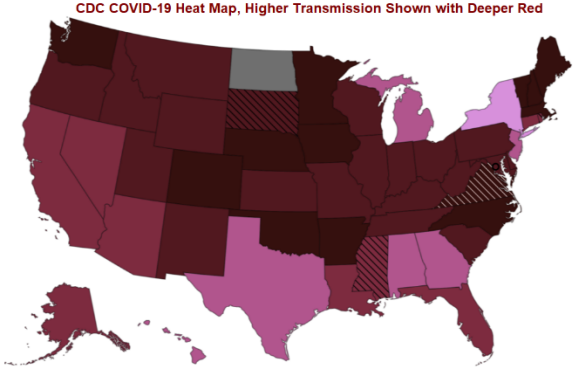
CDC COVID-19 Heat Map, Higher Transmission Shown with Deeper Red



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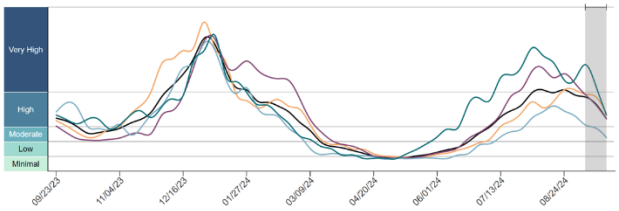

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Announcements

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, NBC, and FOX:
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
Dr. Hoerger joined Dr. Moriarty and COVID-19 Resources Canada. We will post a link when the archived video is available. We received an update that the archived version is in progress.

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