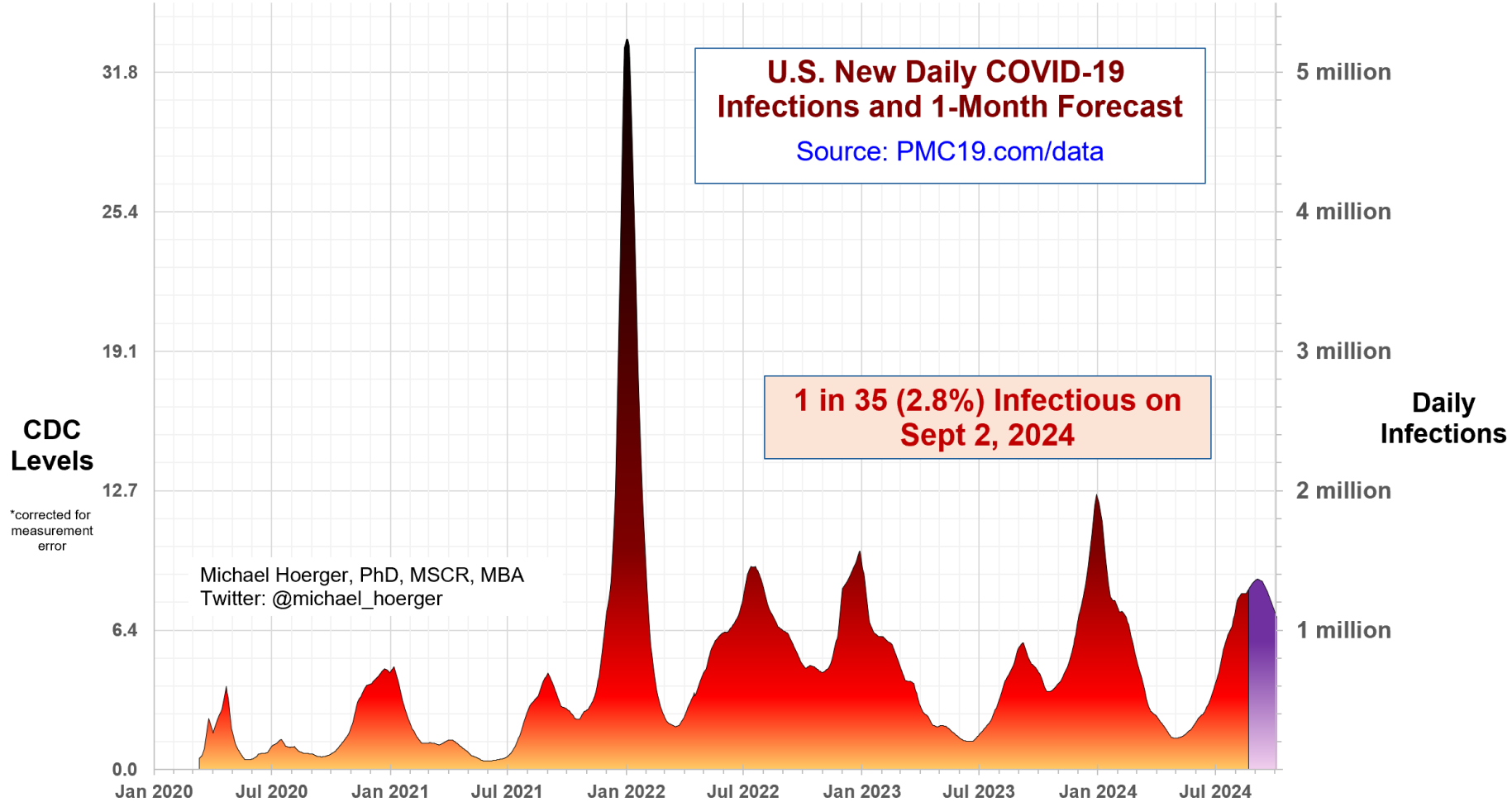
PMC U.S. COVID-19 Case Estimation and Forecasting Model: Report for September 2, 2024, pmc19.com/data

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



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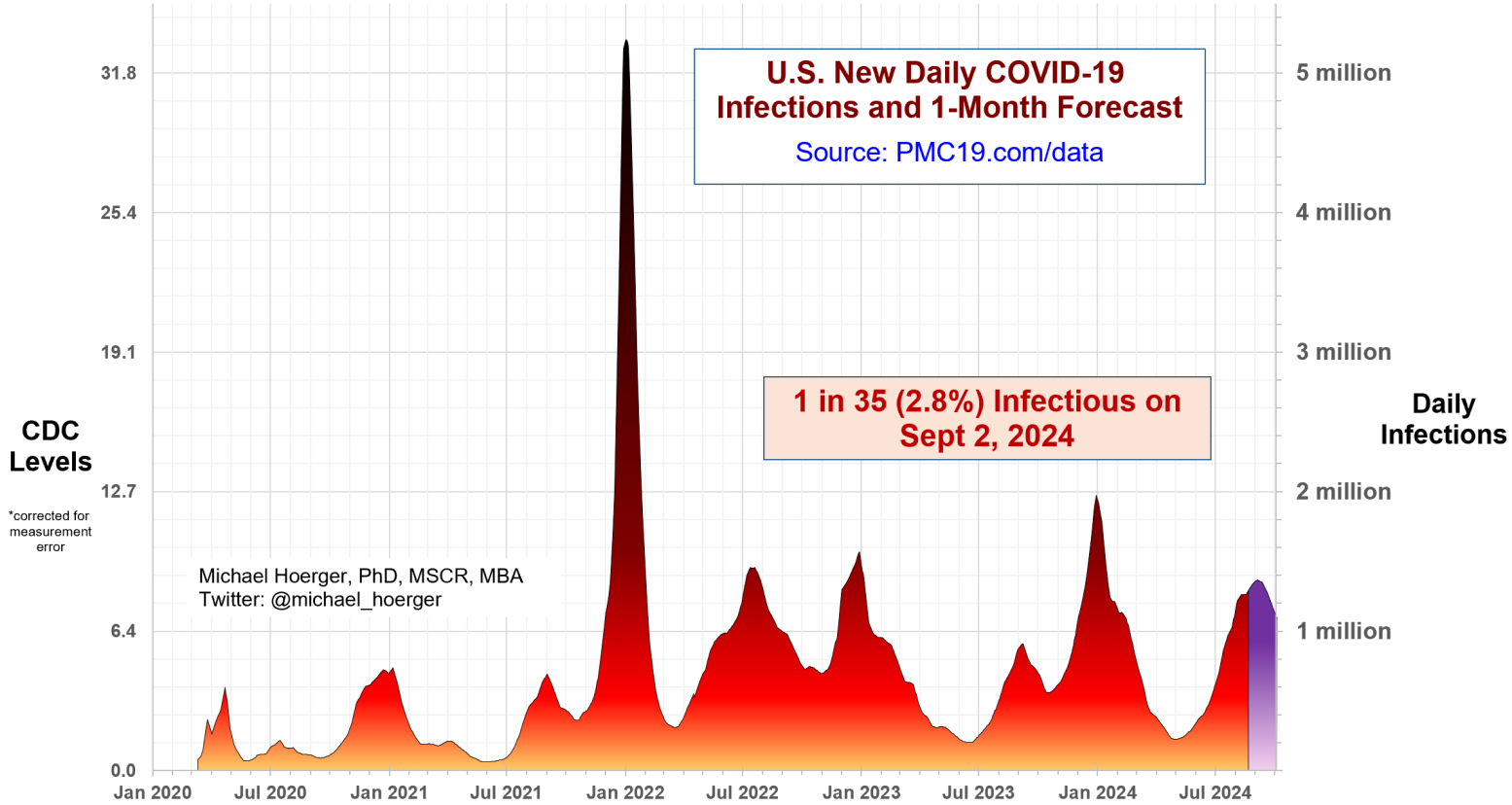
The Big-Picture View of the Pandemic

We are well into the 9th wave of the pandemic, which at 1.4 million infections/day in the U.S. may wind up the largest summer surge all-time. Expect an average of approximately 1.3 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. In recent waves, 50-60% of transmission occurs after the peak day, and we expect high transmission the remainder of 2024.



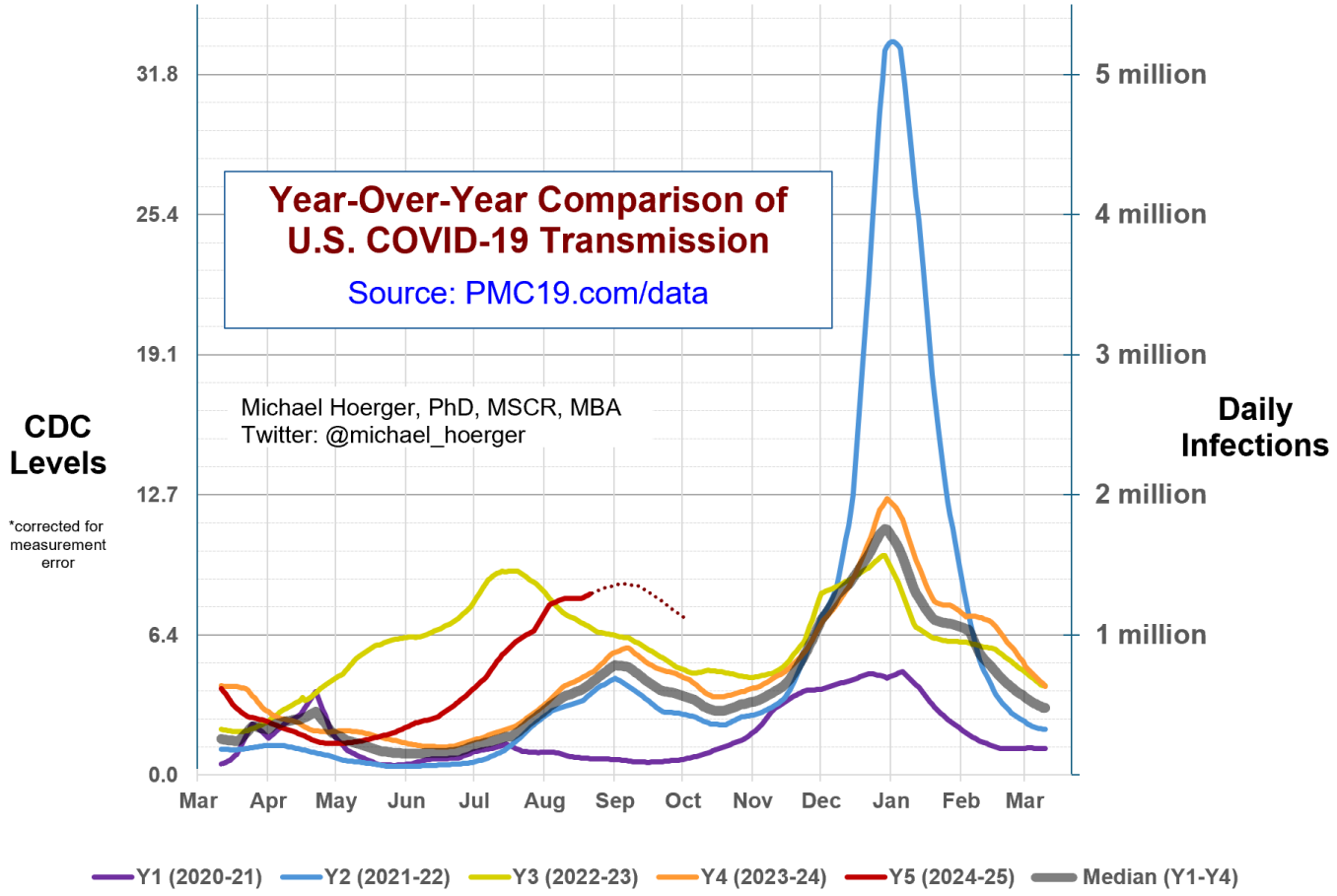
Technical Update

Current case levels and the forecast rely heavily on CDC data and Biobot (former CDC contractor data). Being able to use two competing data sources offers immense value for estimating real-time levels. Biobot has skipped their past two weekly updates on Wednesdays, with no public explanation, which has not happened before. We were weighting incoming CDC data at 60% and Biobot data at 40%. We have retroactively downgraded Biobot from 40% at the start of July to 20% by the end of July, and are holding at 20% currently. If Biobot does not post an explanation or data this Wednesday, they will be downgraded to 0% in the model, as weeks old data provide little information above and beyond that from a single-real-time data source. Such changes will be noted in a Version 2.0.01 of the Technical Appendix when needed.

You will note the model shows higher forthcoming levels this week than last week, for two reasons. One, the Biobot data were suggesting much lower transmission for the summer wave. It may be that they were experiencing delays getting data in, or other issues. Regardless, in downgrading their data, based on perceived data quality, the effect is to defer more to the CDC, which suggests higher transmission. Second, we are in unprecedented times in terms of geographic variation in summer Covid transmission. The West and South are peaking and heading down, but the Midwest and Northeast are increasing – faster. The current model does not account for these inter-region dynamics, so does not account for the Midwest/Northeast increasing *faster* than the other regions are decreasing. It does account for “back to school” based on typical annual patterns in transmission, so know this is not solely a back-to-school wave, but an unprecedented back-to-school surge. Once we roll out regional forecasts, we will be able to account for these differences more effectively. In the meantime, note that we are in uncharted territory in terms of regional variation, likely with the 1-day isolation period and other declines in mitigation exacerbating regional/cultural variation in transmission. Assuming Biobot does not fulfill their public expectation to update their data on Wednesday, they will be downgraded to a weight of 0% in the model, the CDC data upgraded to 100%. **We anticipate that such re-weighting will result in an estimate that this is the highest-peaking summer surge all-time.**

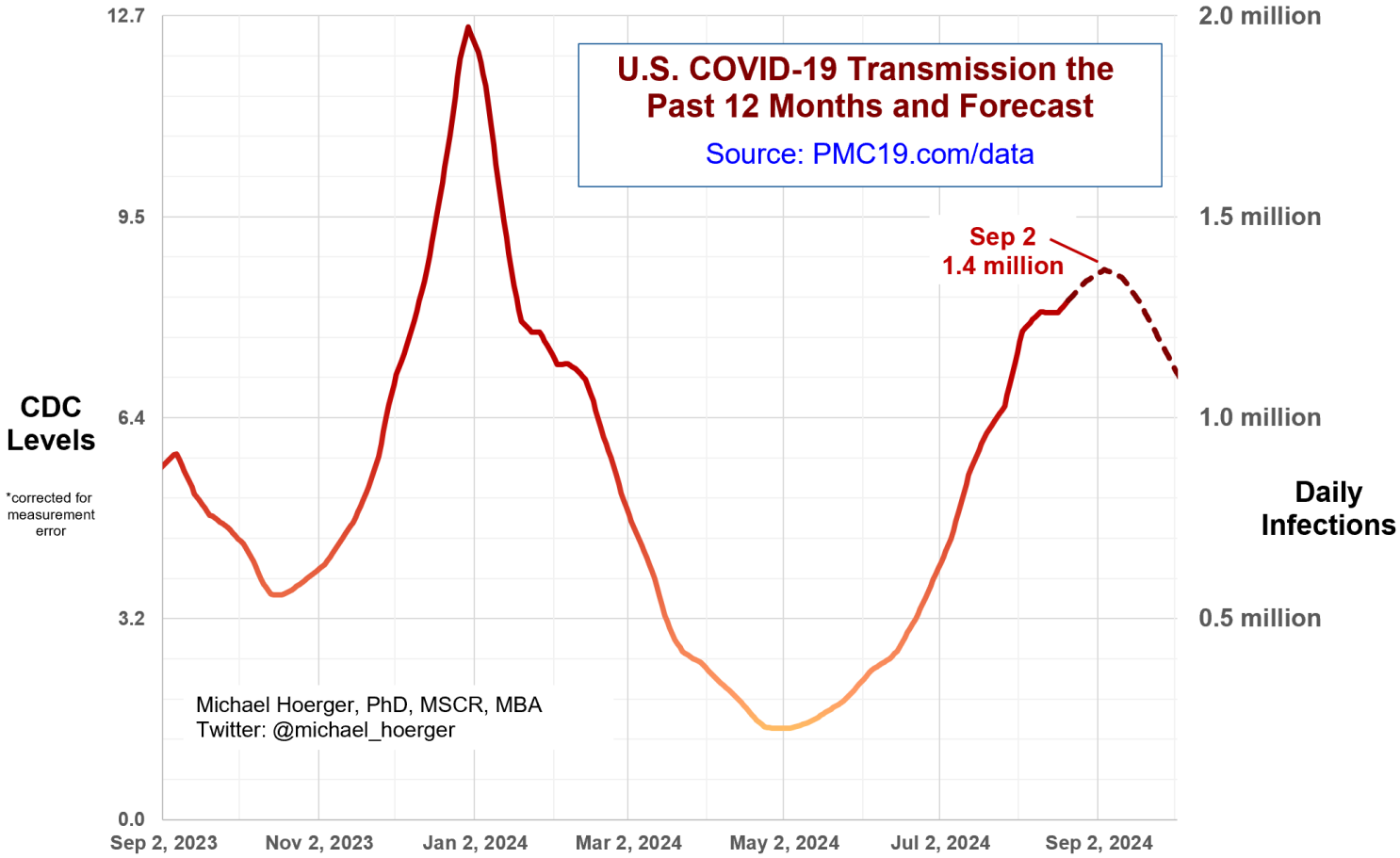
Year-Over-Year Comparisons

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/September. The surge 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 1.4 million current infections per day in the U.S. If we must officially “sunset” Biobot data, expect a retroactive correction to a peak of approximately 1.5 million daily infections, assuming the CDC data also hold. We are at about double the transmission rate of Delta that had everyone very concerned 3 years ago. This is the largest surge during the back-to-school period, and we will soon know whether this is the largest summer surge all-time.



Supplemental Statistics

These supplemental statistics may prove useful in conversations about transmission and mitigation. To highlight a few, 1 in 35 people are actively infectious, with nearly 1.4 million infections/day – very similar to Dr. Moriarty's 1-in-32 estimate in Canada. Over the next month, expect about 1.3 million infections/day on average. In a school classroom of 25 people, it should be assumed that someone (about a 50% chance) has infectious COVID. Transmission is higher than during 91.6% of the pandemic, lower than just 8.4% 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.

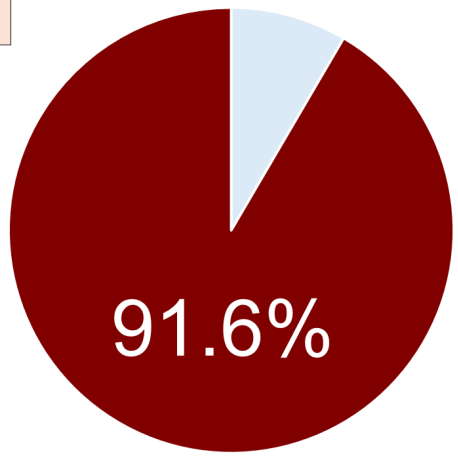
Current Levels for Sep 2, 2024
% of the Population Infectious
2.8% (1 in 35)
New Daily Infections
1,360,000
New Weekly Infections
9,520,000
Resulting Weekly Long COVID Cases
476,000 to 1,904,000

Monthly Forecast
Average % of the Population Infectious
2.7% (1 in 37)
Average New Daily Infections
1,280,367
New Infections During the Next Month
38,411,000
Resulting Monthly Long COVID Cases
1,921,000 to 7,682,000

Running Totals
Infections Nationwide in 2024
191,899,000
Average Number of Infections Per Person All-Time, U.S.
3.36

How Does Risk Increase with More Social Contacts?

Number of People	Chances Anyone Is Infectious	Number of People	Chances Anyone Is Infectious
1	2.8%	15	35.1%
2	5.6%	20	43.9%
3	8.3%	25	51.4%
4	10.9%	30	57.9%
5	13.4%	35	63.6%
6	15.9%	40	68.5%
7	18.3%	50	76.4%
8	20.6%	75	88.5%
9	22.9%	100	94.4%
10	25.1%	300	99.9%



There is more COVID-19 transmission today than during 91.6% of the pandemic.

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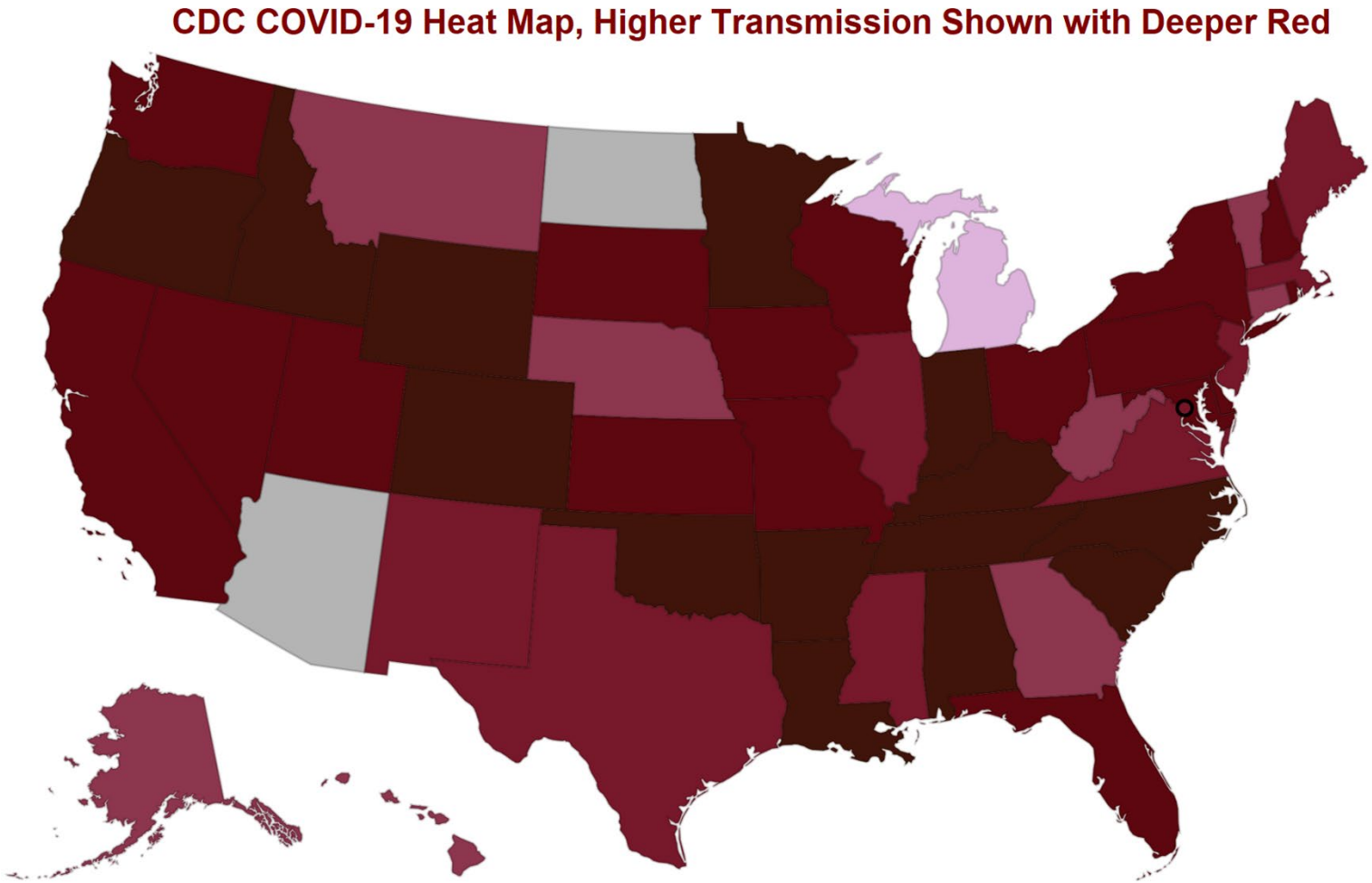
Michael Hoerger, PhD, MSCR, MBA
Twitter: @michael_hoerger

CDC COVID-19 Heat Map

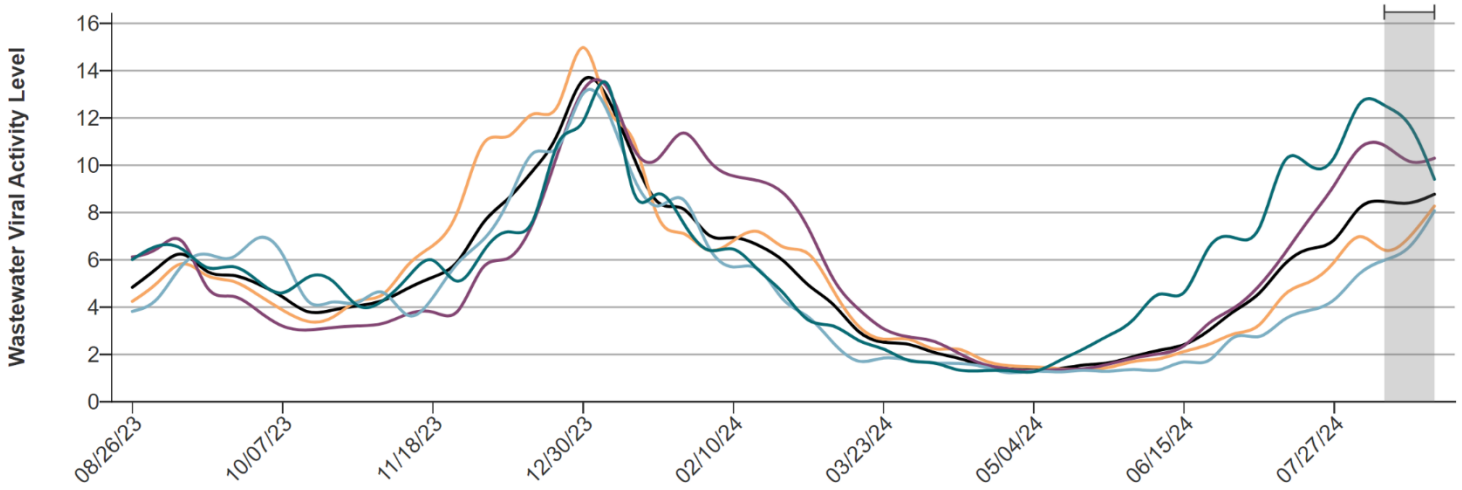
This map uses the CDC state-by-state data to show areas with higher transmission in deeper red. The West and South are peaking, while the Midwest and Northeast are approaching the peak, so there is extreme regional volatility, as indicated by the lack of clear regional pattern on the map. The CDC version of the map, colored in cool blue is available online: 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	2.8% (1 in 35)	2.9% (1 in 35)
Northeast	2.6% (1 in 38)	2.7% (1 in 38)
Midwest	2.7% (1 in 37)	2.7% (1 in 37)
South	3.3% (1 in 30)	3.4% (1 in 29)
West	3.1% (1 in 33)	3.1% (1 in 32)

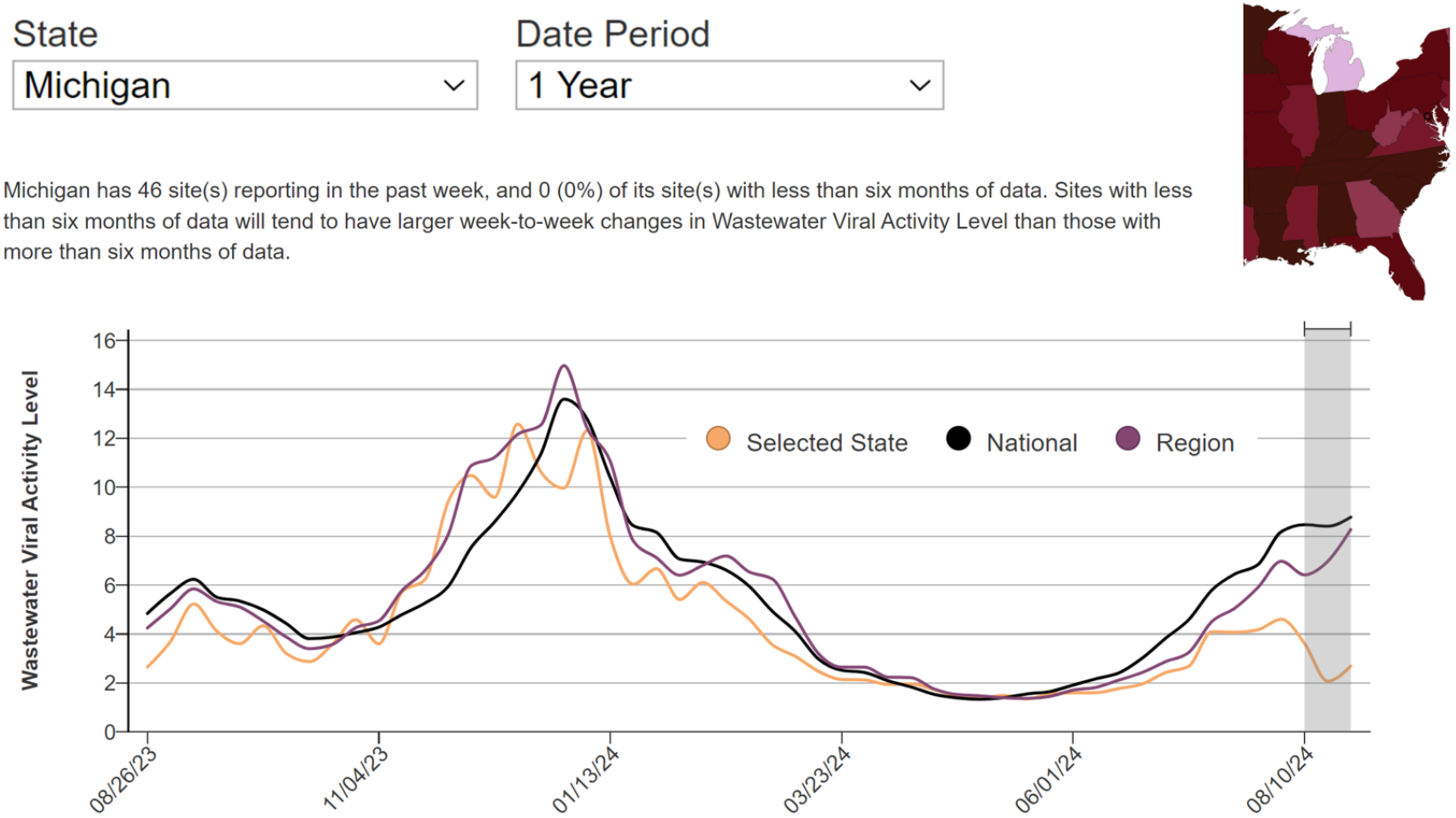
PMC Regional Multiplier*
0.329

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

* 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.

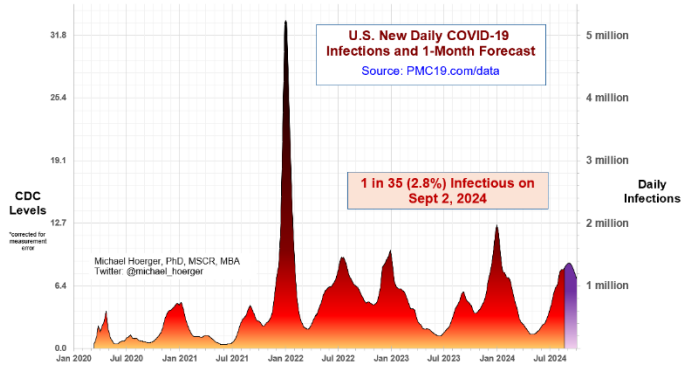
Labor Day State-Level Example: Michigan

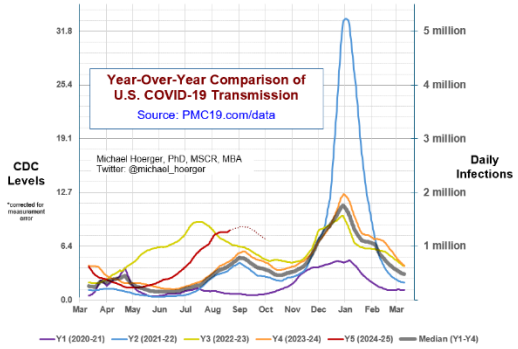
Let's zoom in on Michigan, which currently has lower levels of Covid transmission. Governor "Big Gretch" Gretchen Witmer held strong with more mitigation in the first two years of the ongoing pandemic, which may affect differential immune patterns today. Please reach out with other suggested explanations. Multiplying the Michigan CDC Level (2.69) times the PMC Multiplier (0.329), Michigan is estimated to have 1 in 113 residents (0.9%) actively infectious, which is <1/3 the national average.

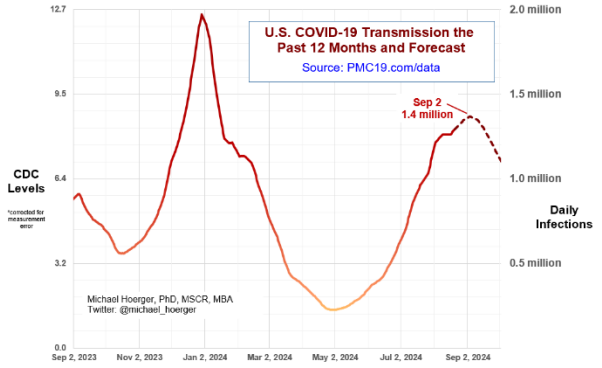


PMC COVID-19 Dashboard

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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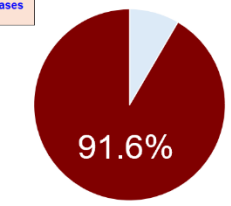

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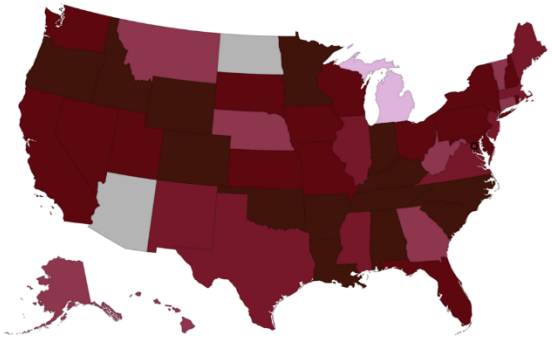
CDC COVID-19 Heat Map, Higher Transmission Shown with Deeper Red



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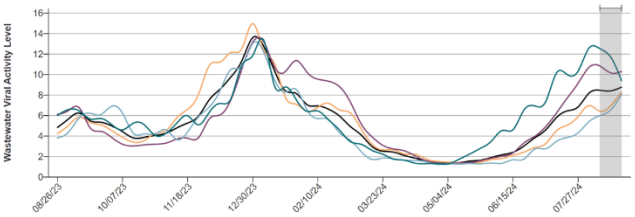

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Announcements

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
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.