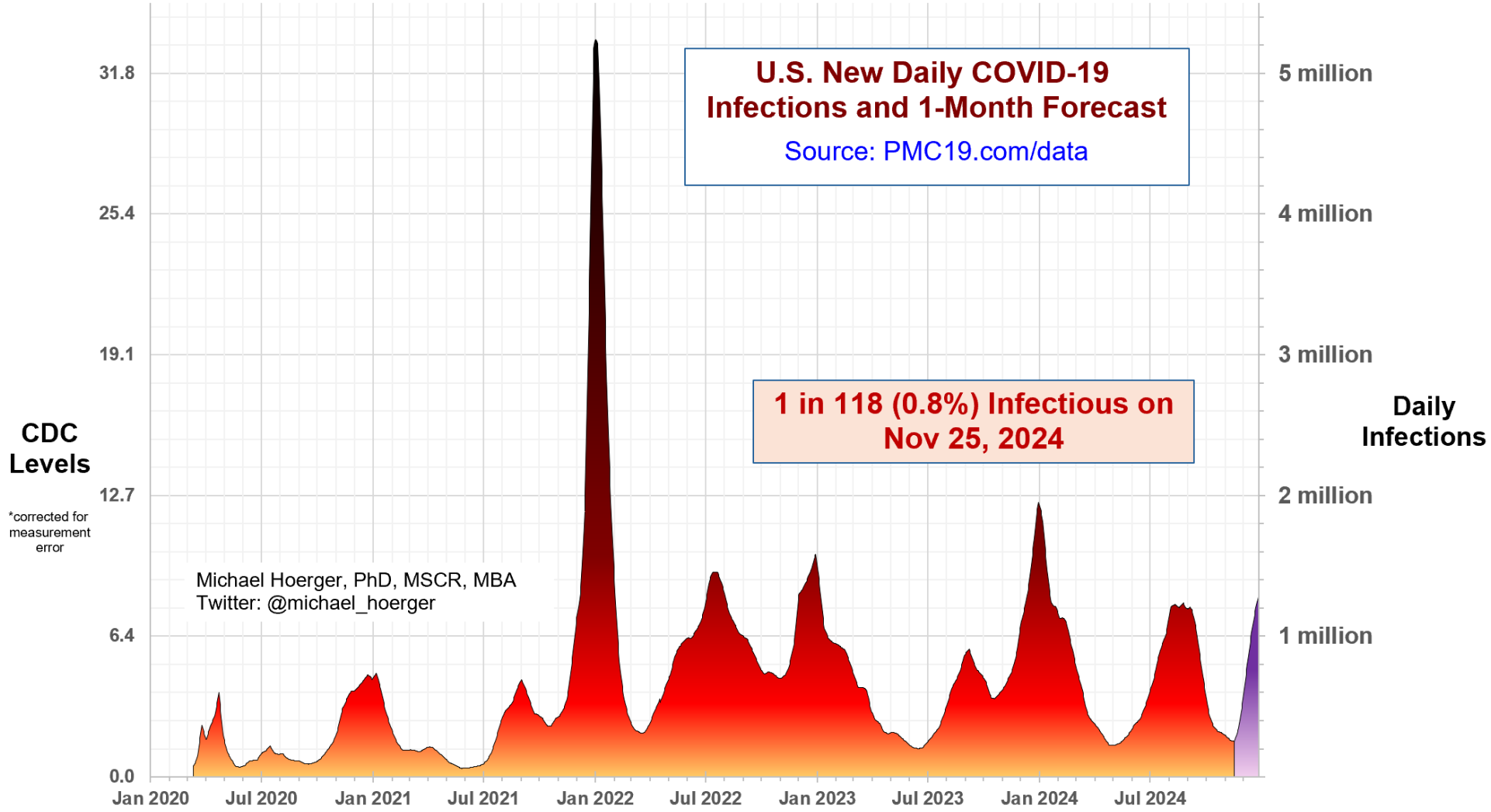
PMC U.S. COVID-19 Case Estimation and Forecasting Model: Report for November 25, 2024, pmc19.com/data

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



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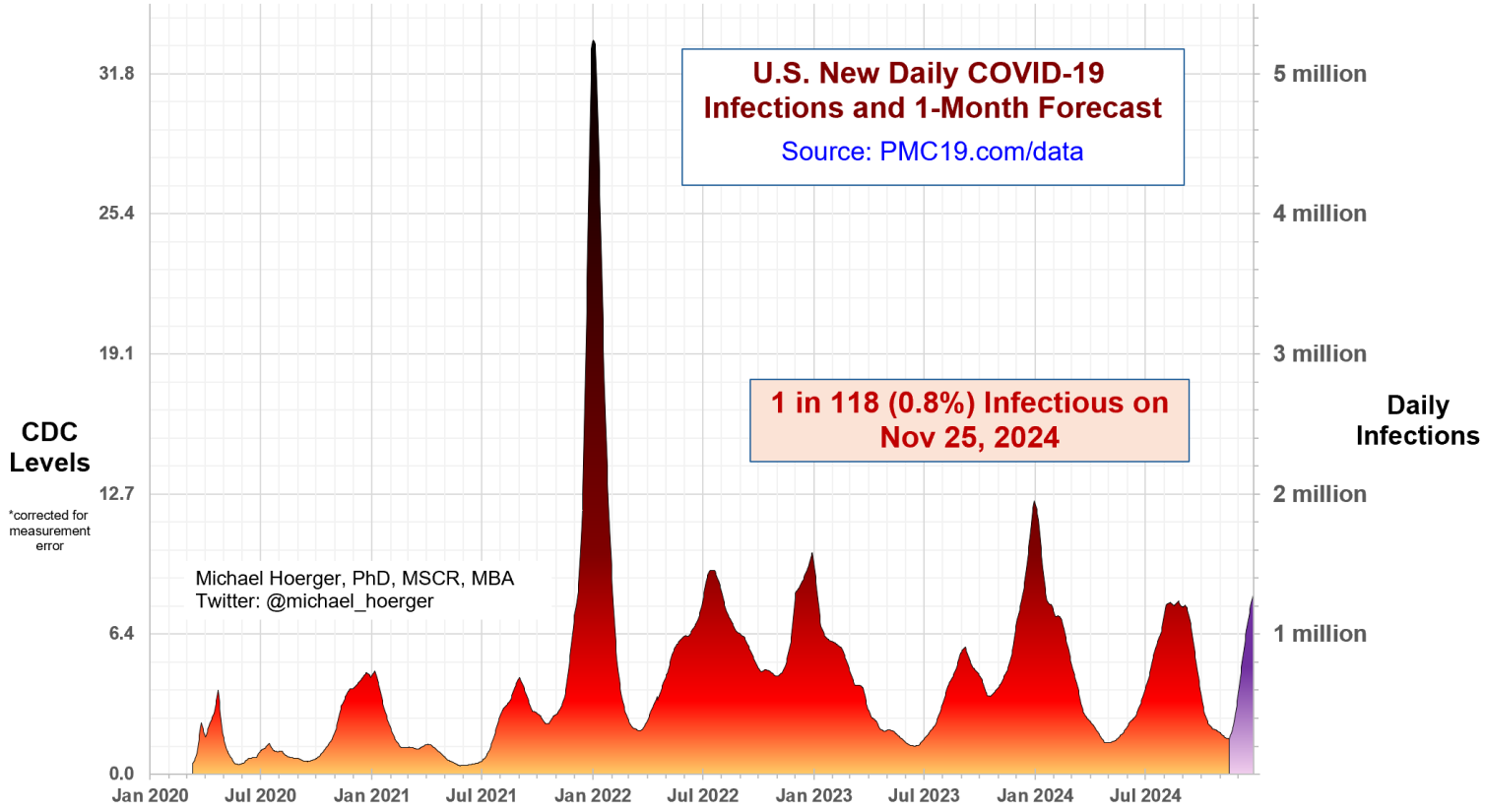
Technical Updates

1) Minor Model Adjustment. We have updated the Technical Appendix to note a minor change in one of the variables in the model. Specifically, we had been using the historical median for each day of the calendar (e.g., the median of each November 25 of the prior years of the pandemic). We now use the average of each median within +/- 3 months of the date. We had intended to roll this out next spring. It shifts the weight of variables in the model from historical patterns to place greater emphasis on recent patterns of transmission, which has pros and cons. It should help with forecasting waves that are less conforming to historical patterns, which is a clear benefit for the summer. It may help with the winter wave too, given less typical patterns of subvariant evolution.

2) CDC Graph Revision. The CDC modified its graph of regional transmission last Tuesday without explanation. The effect is to make Covid transmission appear lower during lulls. We comment on this issue on pg. 8. This is an minor explanatory update and not noted in the Technical Appendix.

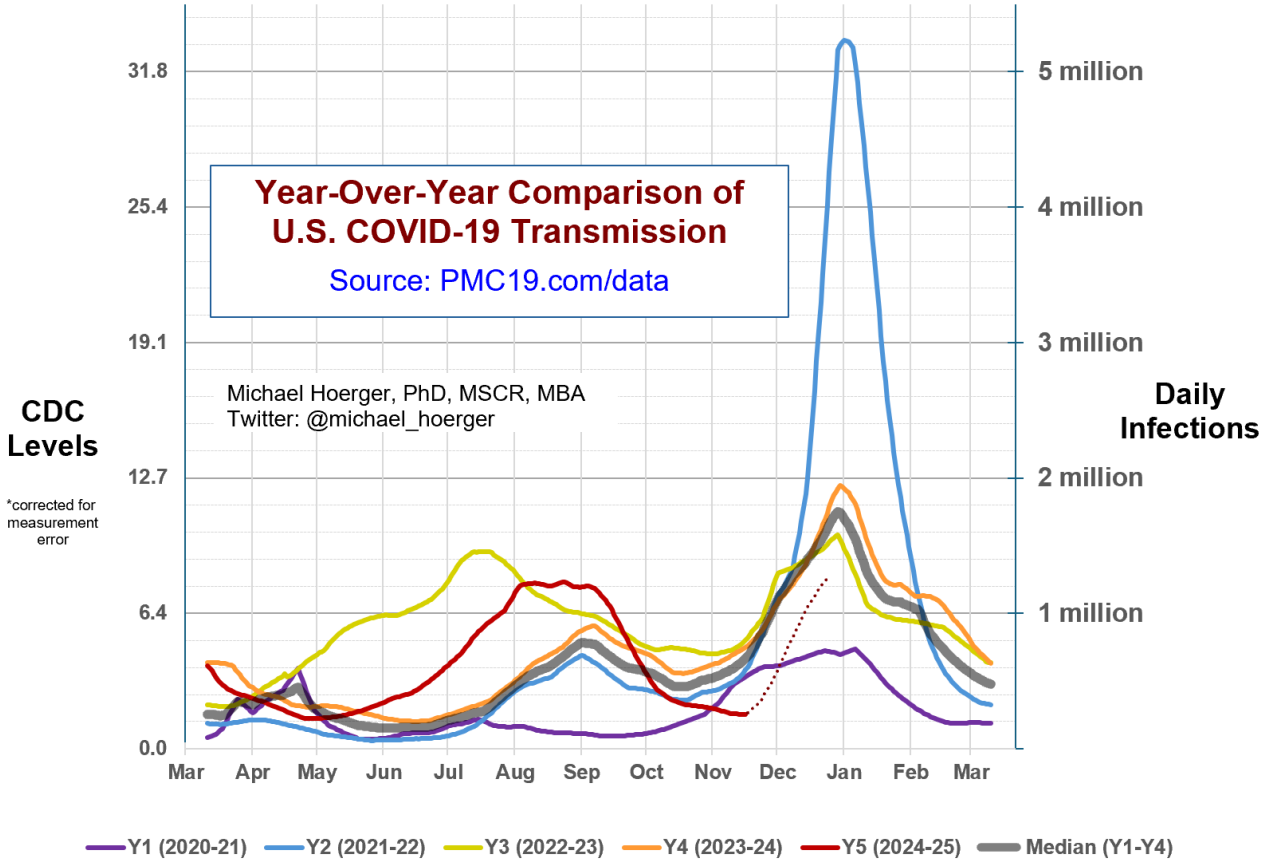
The Big-Picture View of the Pandemic

The 10th wave of COVID in the U.S. has quite likely begun, though later than the model has suggested previously. After some slight upturns, most of the dashboards have reverted back toward lower or flat transmission. Biobot, which had ticked up lightly last week, was retroactively corrected downward. CDC levels have the South continuing downward, while all other regions show light increases in transmission. Walgreens has positivity ratios downward. Dr. Moriarty's lab in Canada has transmission picking up considerably. It is a great time for people to get vaccinated (or vaccinated again if eligible) and squeeze in any medical/dental appointments before transmission is considerably worse.



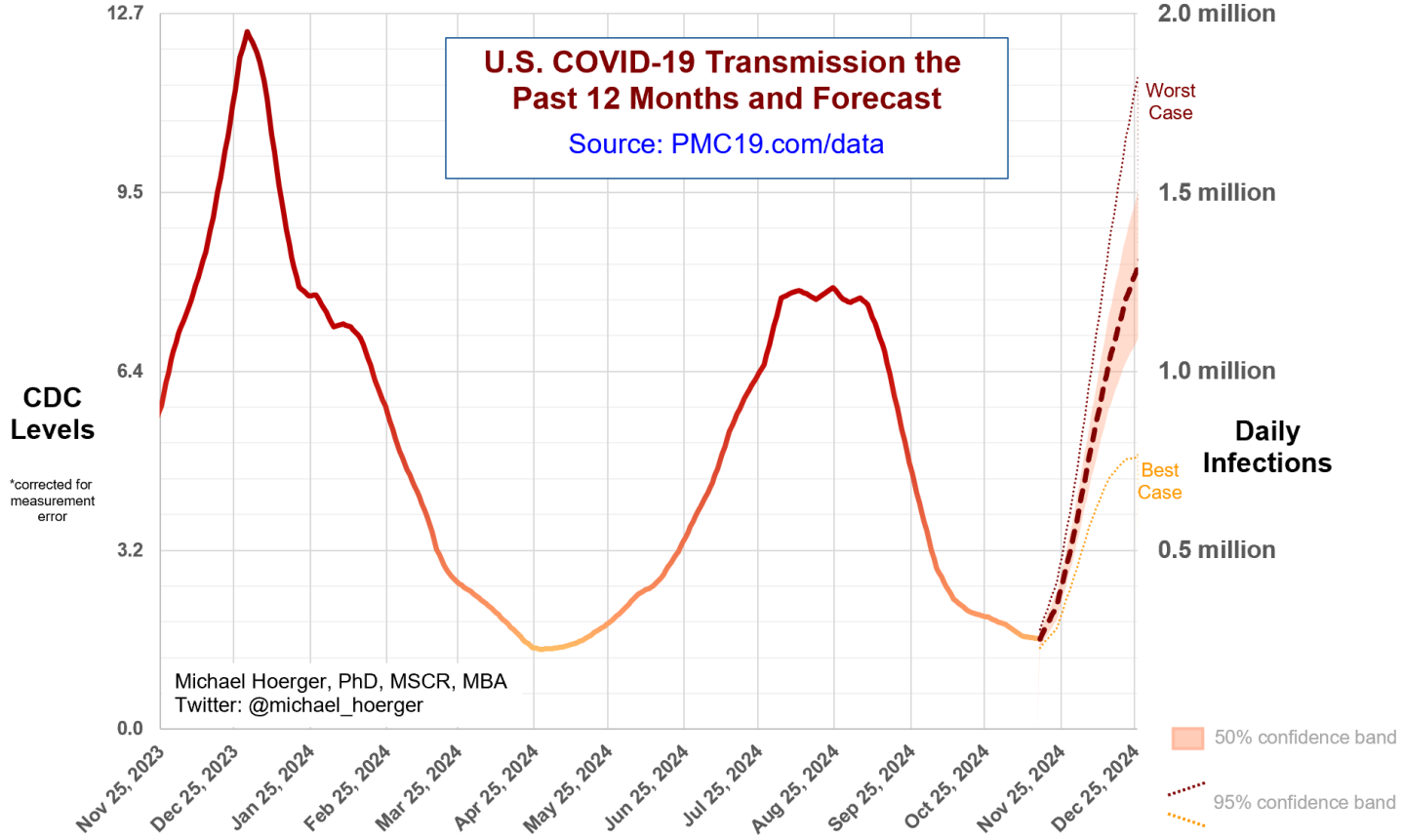
Year-Over-Year Comparisons

This is the most useful graph in this report because it clearly shows how 2024 transmission has varied so considerably from prior years. A best case scenario would be that around Christmas, transmission is similar to the winter of Y1 of the pandemic, which is similar to the summer waves of Y2 and Y4. These waves represent considerable transmission. A worst case scenario would be reaching transmission slightly below the winter median, similar to Y4. Likely, transmission will fall in between.



Close-up on the Current Forecast

Note that the updated forecast suggests that by Christmas, we may see 1.3 million daily infections. If the CDC levels rise this coming Friday (November 29, if reported), the forecast is on pace. Subtract about 200,000 daily infections from that estimate for each additional week the CDC levels remain flat. In a best case scenario, transmission will be closer to 700,000 daily infections. This is similar to what Dr. Eastman's MAPS forecast has suggested recently. That is very bad transmission but not nearly as bad as the worst case scenario of about 1.8 million daily infections.



Supplemental Statistics

These supplemental statistics may prove useful in conversations about transmission and mitigation. The numbers are similar to last week. We see that 1 in 118 are actively infectious, or 0.8% of the population. In a university classroom of 75-100 people, it should be assumed that someone (about a 50% chance) has infectious COVID. Transmission is higher than 48% of the pandemic and lower than 52% of the pandemic. The impact on potential Long COVID cases the next month will be staggering, and expect high transmission in December and January.

Current Levels for Nov 25, 2024
% of the Population Infectious
0.8% (1 in 118)
New Daily Infections
404,000
New Weekly Infections
2,828,000
Resulting Weekly Long COVID Cases
141,000 to 566,000

Monthly Forecast
Average % of the Population Infectious
1.8% (1 in 56)
Average New Daily Infections
858,633
New Infections During the Next Month
25,759,000
Resulting Monthly Long COVID Cases
1,288,000 to 5,152,000

Running Totals
Infections Nationwide in 2024
233,786,000
Average Number of Infections Per Person All-Time, U.S.
3.48

How Does Risk Increase with More Social Contacts?			
Number of People	Chances Anyone Is Infectious	Number of People	Chances Anyone Is Infectious
1	0.8%	15	12.0%
2	1.7%	20	15.6%
3	2.5%	25	19.1%
4	3.3%	30	22.5%
5	4.2%	35	25.7%
6	5.0%	40	28.8%
7	5.8%	50	34.6%
8	6.6%	75	47.1%
9	7.4%	100	57.2%
10	8.1%	300	92.2%

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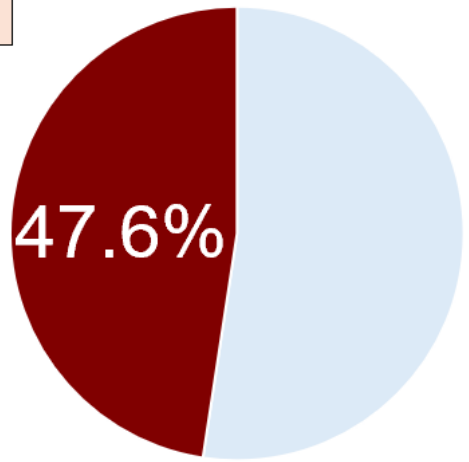
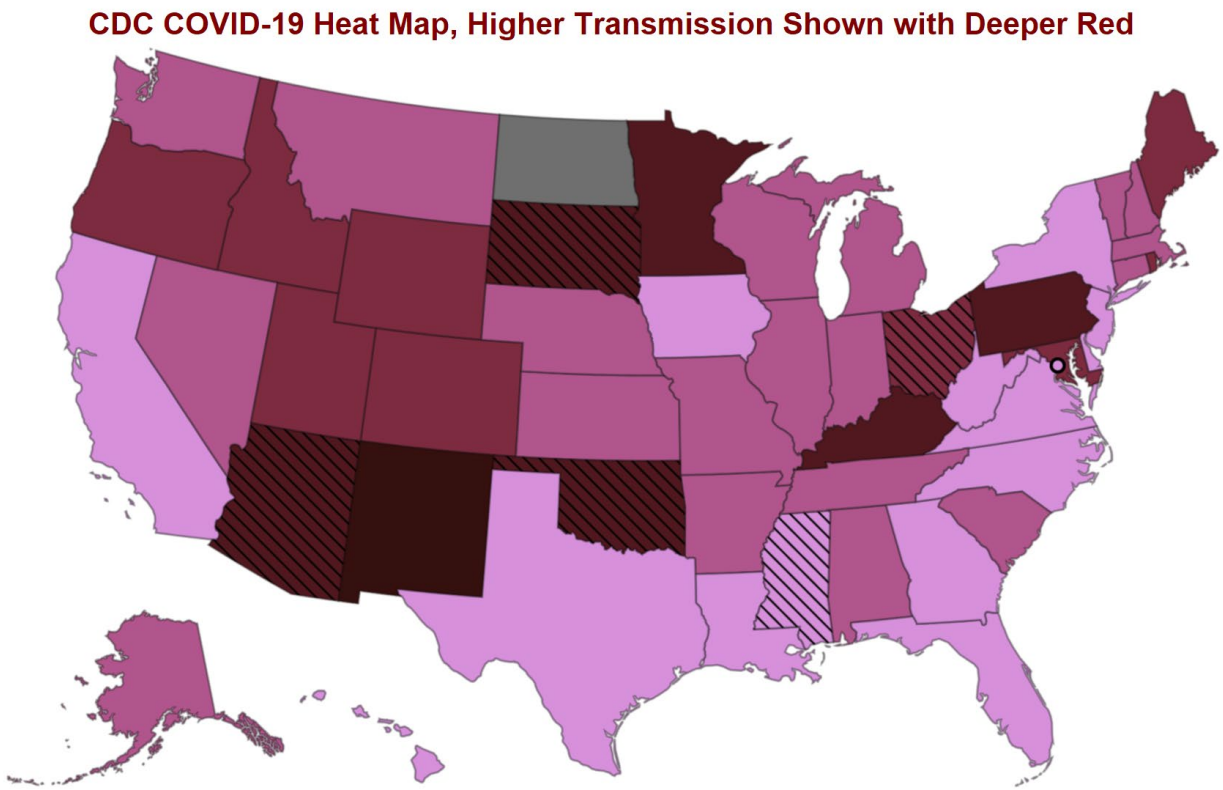


There is more COVID-19 transmission today than during 47.6% of the pandemic.

CDC COVID-19 Heat Map

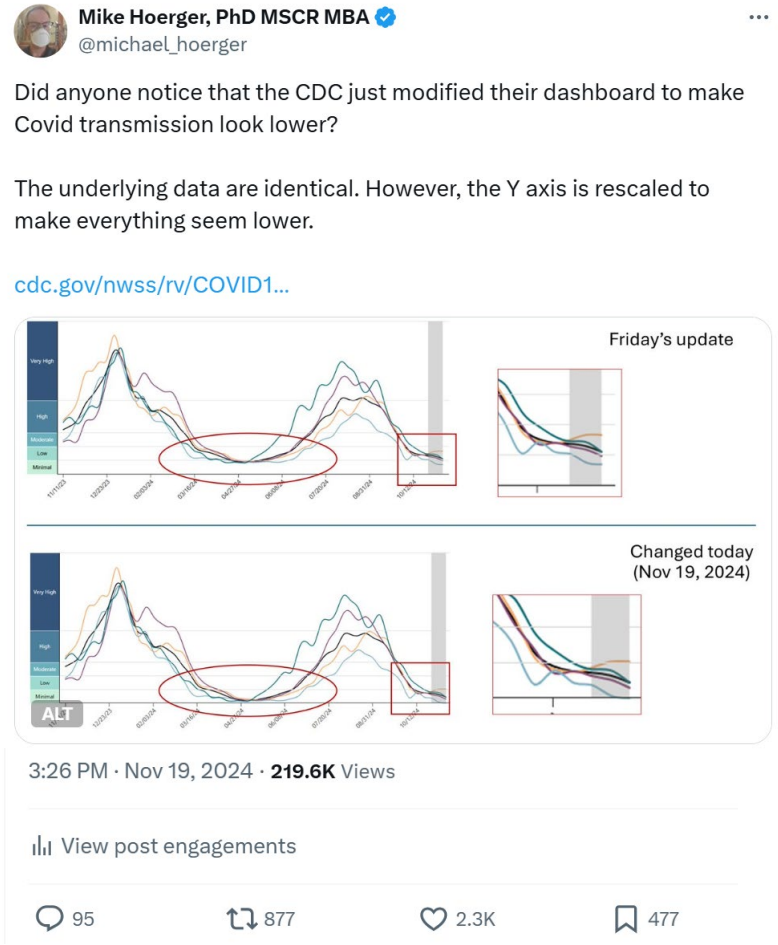
This map uses the CDC state-by-state data to show areas with higher transmission in deeper red. Notice the considerable geographic variation. The CDC version of the map, colored in cool blue is available online. Blue tends confuse people into thinking transmission is “cool” or low, so we and various 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 university has provided an institutional license for ArcGIS, and we hope to have an automated and improved version of the map available soon.



Regional Case Estimation

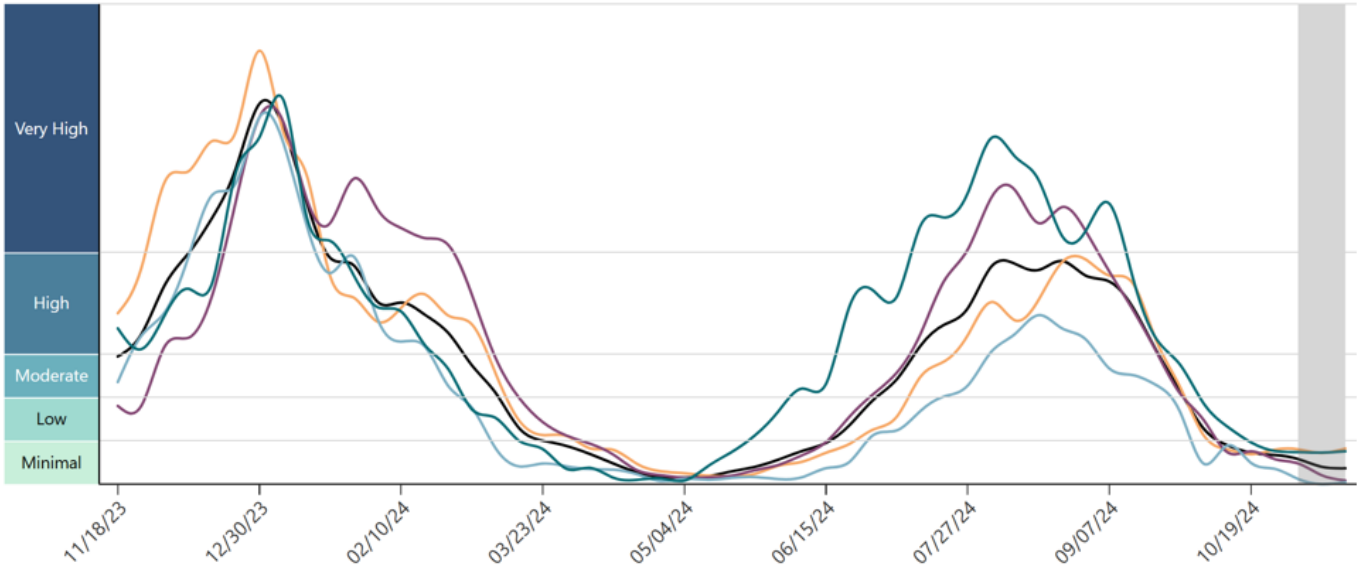
On Tuesday, the CDC updated its regional transmission graph without explanation to modify the Y axis in such a way that it makes lulls appear lower – near zero transmission – when in fact transmission is still occurring at likely hundreds of thousands of infections per day. When using their data, note that all levels should be adjusted upward. This is a fundamental statistical mistake.



With that caveat, 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	0.8% (1 in 118)	0.5% (1 in 186)
	Northeast	0.6% (1 in 163)	0.4% (1 in 256)
	Midwest	1.2% (1 in 85)	0.7% (1 in 134)
	South	0.6% (1 in 156)	0.4% (1 in 245)
	West	1.1% (1 in 89)	0.7% (1 in 140)

* 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.
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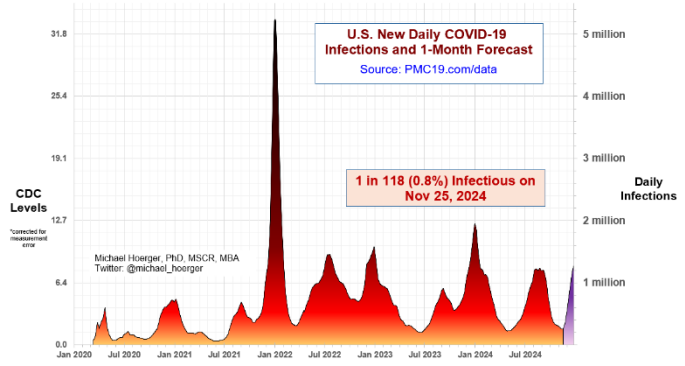

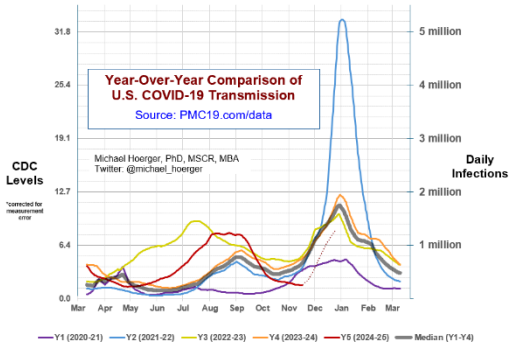

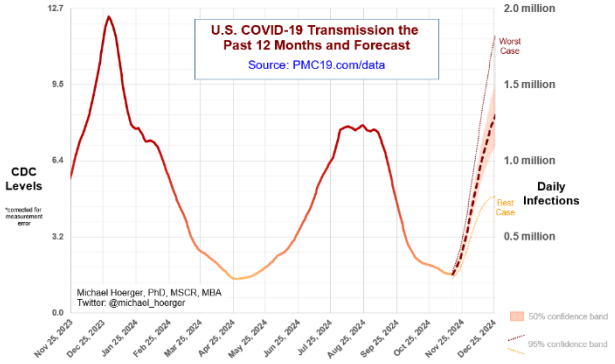

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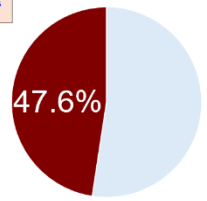

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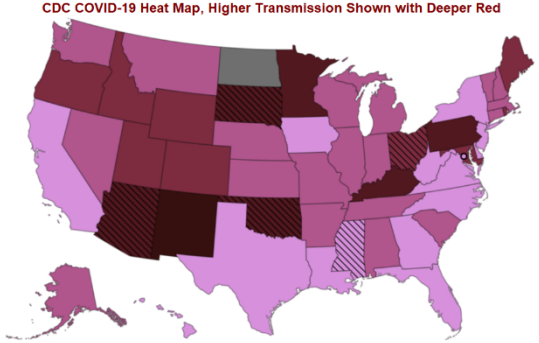
CDC COVID-19 Heat Map, Higher Transmission Shown with Deeper Red



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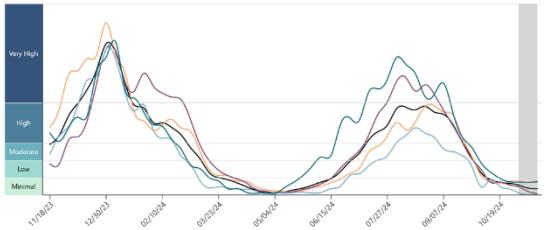

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Announcements

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.

Later in 2024
Dr. Hoerger joins as a guest on the new podcast, Public Health Is Dead. No financial COIs. Catch the trailer online:
https://www.publichealthisdead.com/

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