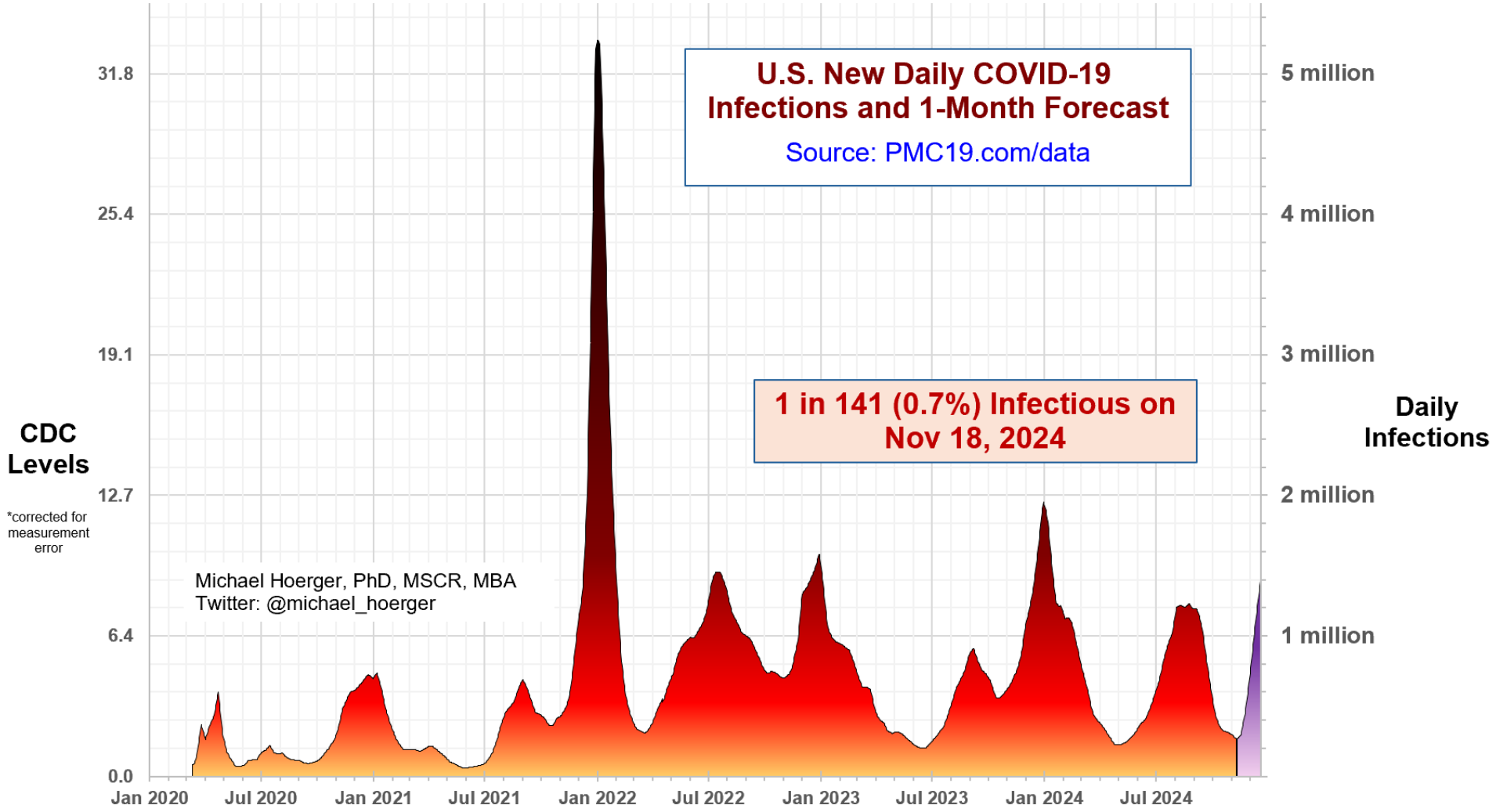
# PMC U.S. COVID-19 Case Estimation and Forecasting Model: Report for November 18, 2024, pmc19.com/data

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

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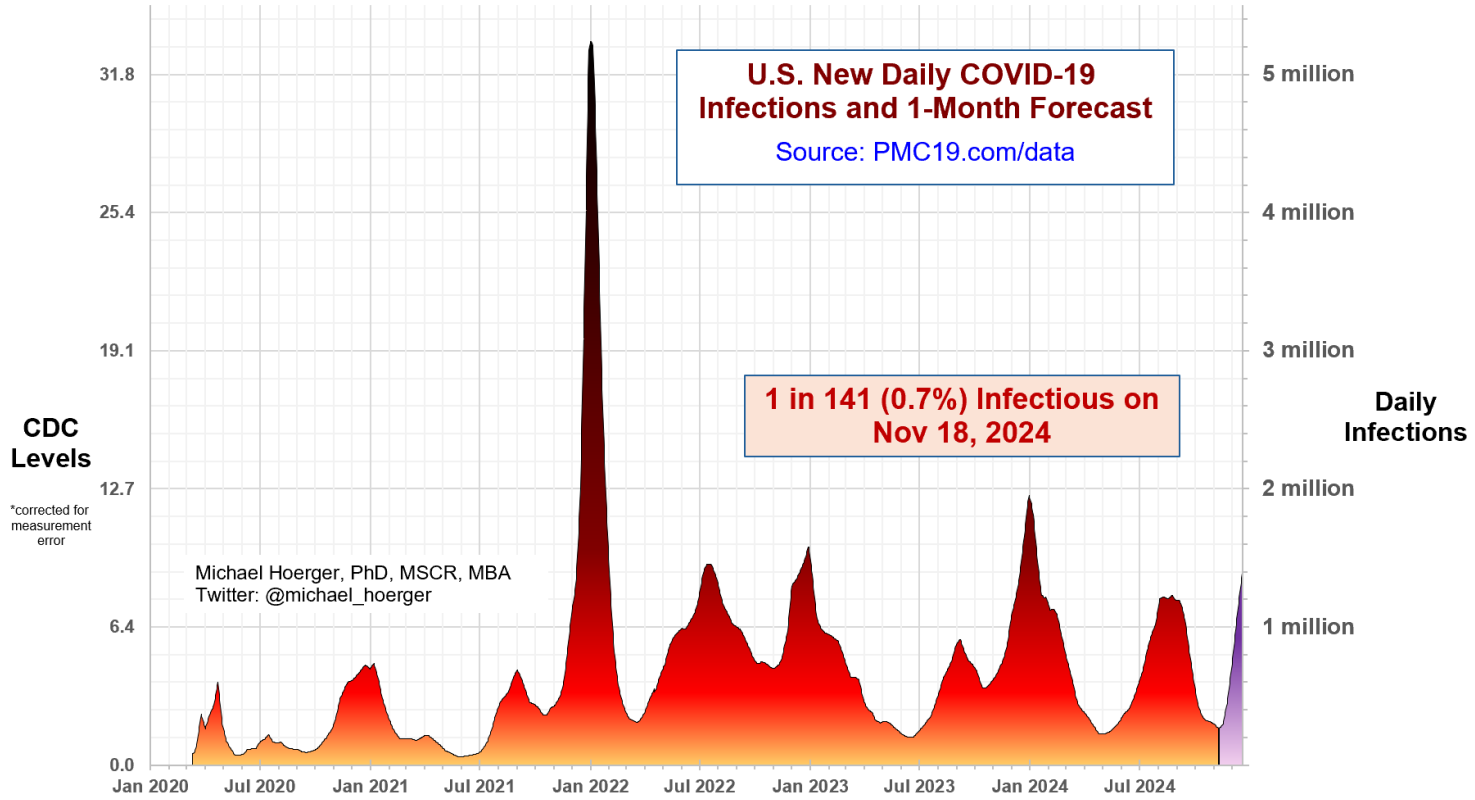
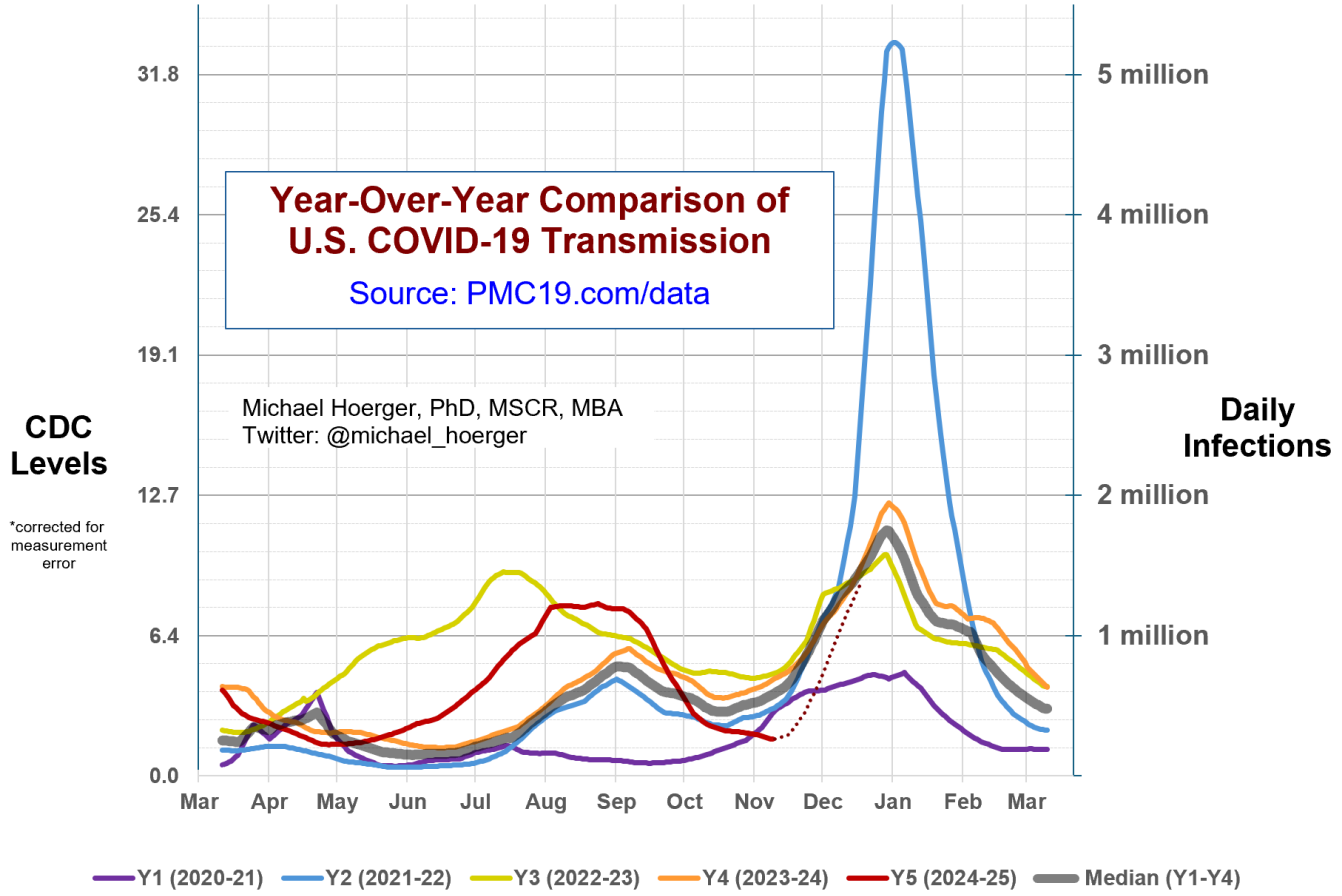
# The Big-Picture View of the Pandemic

The 10th wave of COVID in the U.S. has quite likely begun, though later than the model has suggested previously. The CDC estimates have taken an unanticipated additional downturn at the national level (last reported 10 days ago), characterized by regional variation. Biobot shows the slightest uptick (last reported 12 days ago), as does Walgreens, with testing also up. WastewaterSCAN shows an uptick, but with too much volatility to discern much. Note that the PMC model is weighted 80% CDC data and 20% Biobot data, so if the CDC data hold, the "lull point" will likely be closer to November 7 than the previously estimated October 18. The CDC data should be taken with a grain of salt because reporting is sparse or absent in 7 states, so it is unclear whether the lull is later, or it is more of a reporting issue. The PMC model continues to anticipate a rapid progression, but that assumes that (a) transmission follows patterns similar to prior years, and (b) waves occur with typical form. The summer wave was later, and current lull is later than in prior years, so it is possible we may see peak for the winter wave a week later than usual or that the wave takes a different shape. We expect high transmission soon in 2024. At the moment, transmission remains low in the relative sense, which is a plus in terms of less morbidity and mortality and a greater opportunity for people to complete necessary activities safely.



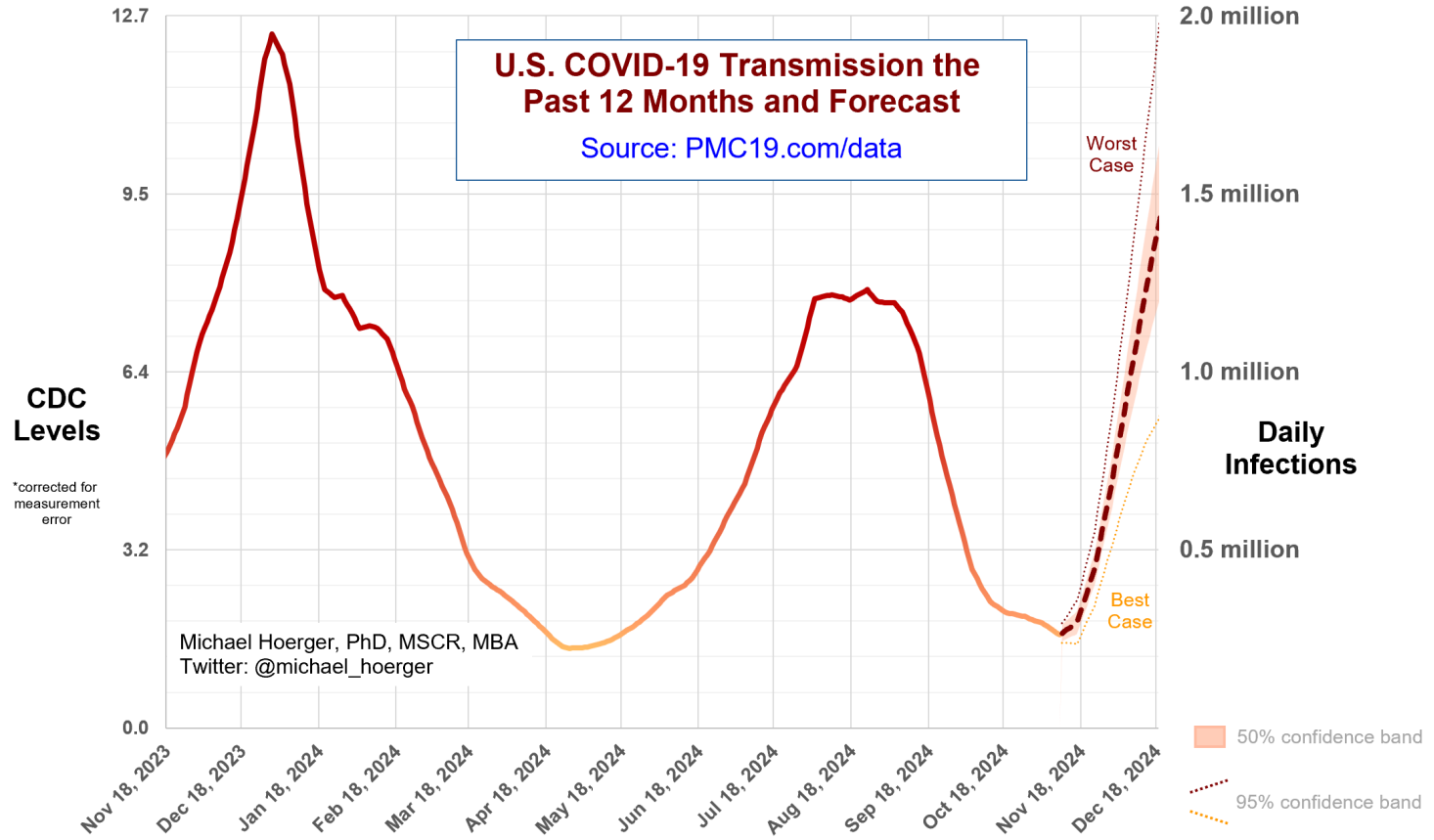
# Year-Over-Year Comparisons

This is the most useful graph in this report because it clearly shows how 2024 transmission has varied so considerably from prior years. Note the later summer wave, the atypical flatness of the "peak" levels of the summer wave, the extremely sharp downturn at the end of the summer wave, and the lull venturing much later than usual. Moreover, with the peak of the summer wave timed with back-to-school, children were likely disproportionately infected, and they are undercounted by wastewater estimated (proportionate to body weight). Each of these features raises more uncertainty around the forecast. Each prior year of the pandemic has had peak transmission very close to New Year's Eve. There are potentially four highly-plausible scenarios: 1) The dotted path as shown with a peak similar to Y3 or the median, 2) a slightly lower-peaking wave of patterns similar to prior years, 3) a slightly-lower peaking wave with much more lingering transmission post-peak than prior years, and 4) a later and slightly lower peak with lingering transmission. The model assumes #1 will be the case. Qualitatively, there is also a good case to be made for #3. By December 1, we will hopefully have a much better sense. Note that this is much later than last year, where the transmission pattern tended to hug the median value, albeit slightly above it, and predictions about the winter wave were relatively reasonable in early November.



# Close-up on the Current Forecast

In a month, the model suggests we may be close to 1.4 million daily infections in the U.S., but basically there is nothing evident in current transmission patterns to suggest transmission will be higher or lower that what has been "typical" (median levels) in prior years. The best-case scenario for a month from now would be about 0.8 million daily infections, and the worst-case scenario would be about 2.0 million daily infections. Qualitatively, as noted in the year-over-year graph discussion, a reasonable scenario would also be closer to the bottom of the 50% confidence band (bottom of the peach color), at about 1.2 million infections/day in a month. By December 1, we will start to get a better sense of which trajectory we are on and get a peek at the potential magnitude of the winter wave. Prepare for the winter ahead assuming it may be similar to last year, with substantial infections, daily disruptions, and resulting long-term health consequences. If lucky, the wave will be smaller. Also note, a smaller peak may mean prolonged post-peak transmission, and parents should plan for the implications of that for the back-to-school period. A critical concern is that many children were infected in the fall, and high school-based transmission could lead to some reinfections within the same children, which would be concerning.



# Supplemental Statistics

These supplemental statistics may prove useful in conversations about transmission and mitigation. The numbers are lower than last week. We see that 1 in 141 are actively infectious, or 0.7% of the population. In a university classroom of 100 people, it should be assumed that someone (about a 50% chance) has infectious COVID. Transmission is higher than 41% of the pandemic and lower than 59% of the pandemic. The impact on potential Long COVID cases the next month will be staggering, and expect high transmission in December.

| Current Levels for Nov 18, 2024 |
|---|
| % of the Population Infectious |
| 0.7% (1 in 141) |
| New Daily Infections |
| 339,000 |
| New Weekly Infections |
| 2,373,000 |
| Resulting Weekly Long COVID Cases |
| 119,000 to 475,000 |

| Monthly Forecast |
|---|
| Average % of the Population Infectious |
| 1.7% (1 in 59) |
| Average New Daily Infections |
| 811,133 |
| New Infections During the Next Month |
| 24,334,000 |
| Resulting Monthly Long COVID Cases |
| 1,217,000 to 4,867,000 |

| Running Totals |
|---|
| Infections Nationwide in 2024 |
| 231,092,000 |
| Average Number of Infections Per Person All-Time, U.S. |
| 3.47 |

| How Does Risk Increase with More Social Contacts? | | | |
|---|---|---|---|
| Number of People | Chances Anyone Is Infectious | Number of People | Chances Anyone Is Infectious |
| 1 | 0.7% | 15 | 10.1% |
| 2 | 1.4% | 20 | 13.3% |
| 3 | 2.1% | 25 | 16.3% |
| 4 | 2.8% | 30 | 19.2% |
| 5 | 3.5% | 35 | 22.1% |
| 6 | 4.2% | 40 | 24.8% |
| 7 | 4.9% | 50 | 29.9% |
| 8 | 5.5% | 75 | 41.4% |
| 9 | 6.2% | 100 | 50.9% |
| 10 | 6.9% | 300 | 88.2% |

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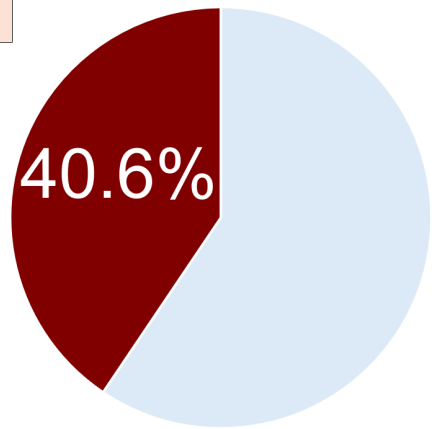


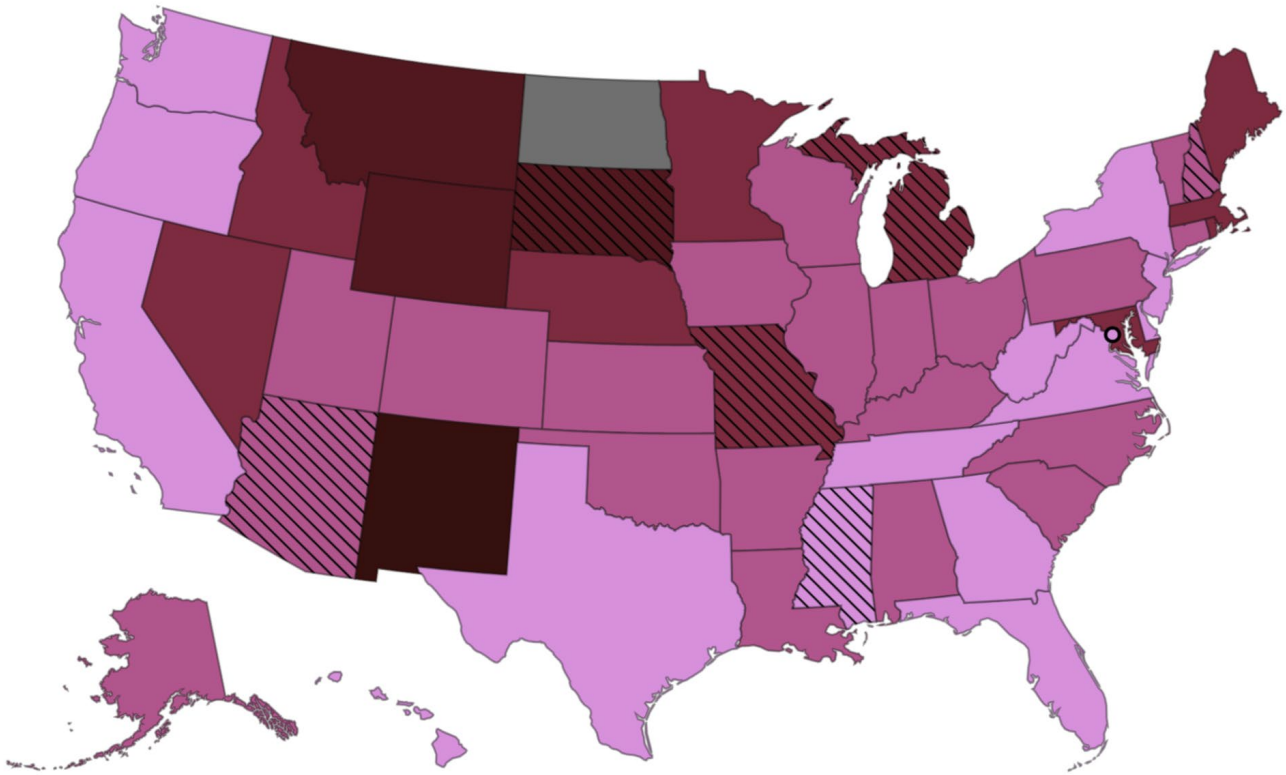

**There is more COVID-19 transmission today than during 40.6% of the pandemic.**

# 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.

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

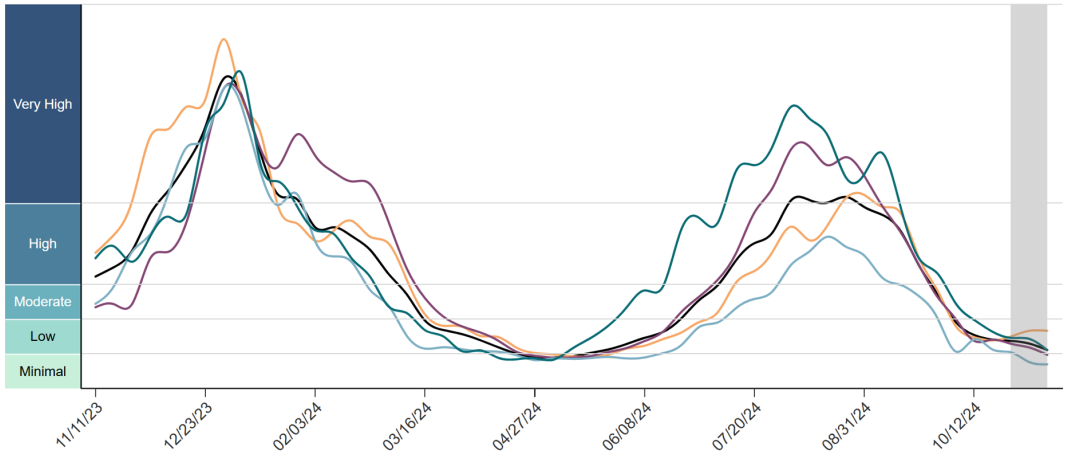


# Regional Case Estimation

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 | 0.7% (1 in 141) | 0.5% (1 in 183) |
| | Northeast | 0.4% (1 in 225) | 0.3% (1 in 292) |
| | Midwest | 1.1% (1 in 94) | 0.8% (1 in 122) |
| | South | 0.6% (1 in 161) | 0.5% (1 in 209) |
| | West | 0.7% (1 in 141) | 0.5% (1 in 183) |

* 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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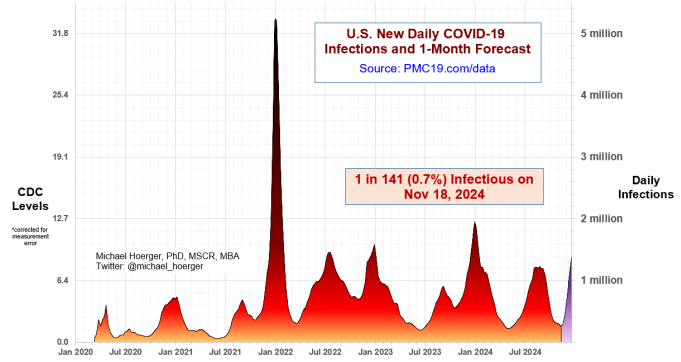


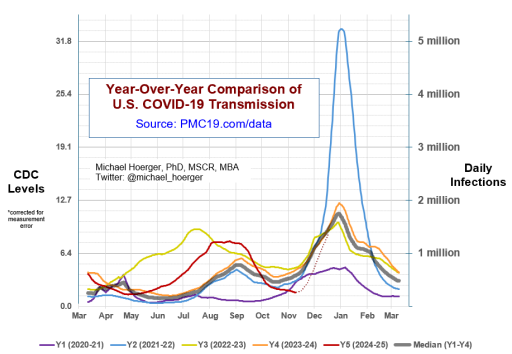


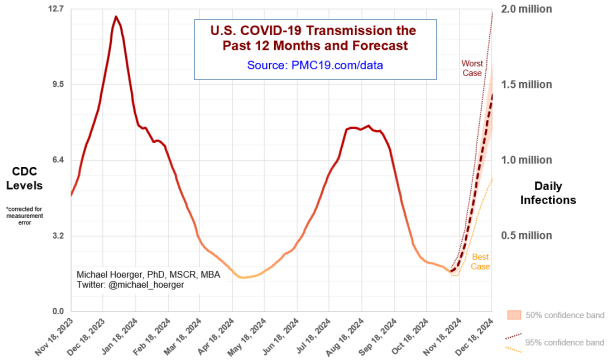


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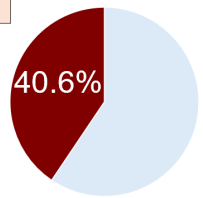


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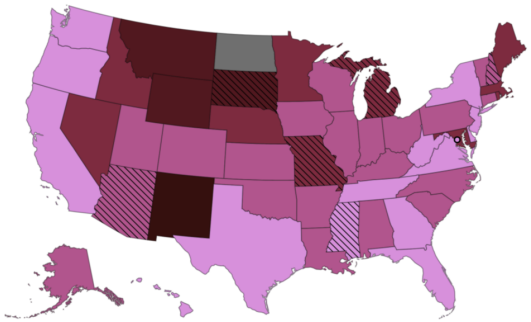

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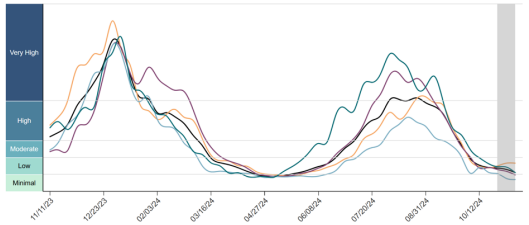


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# Announcements

**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.**