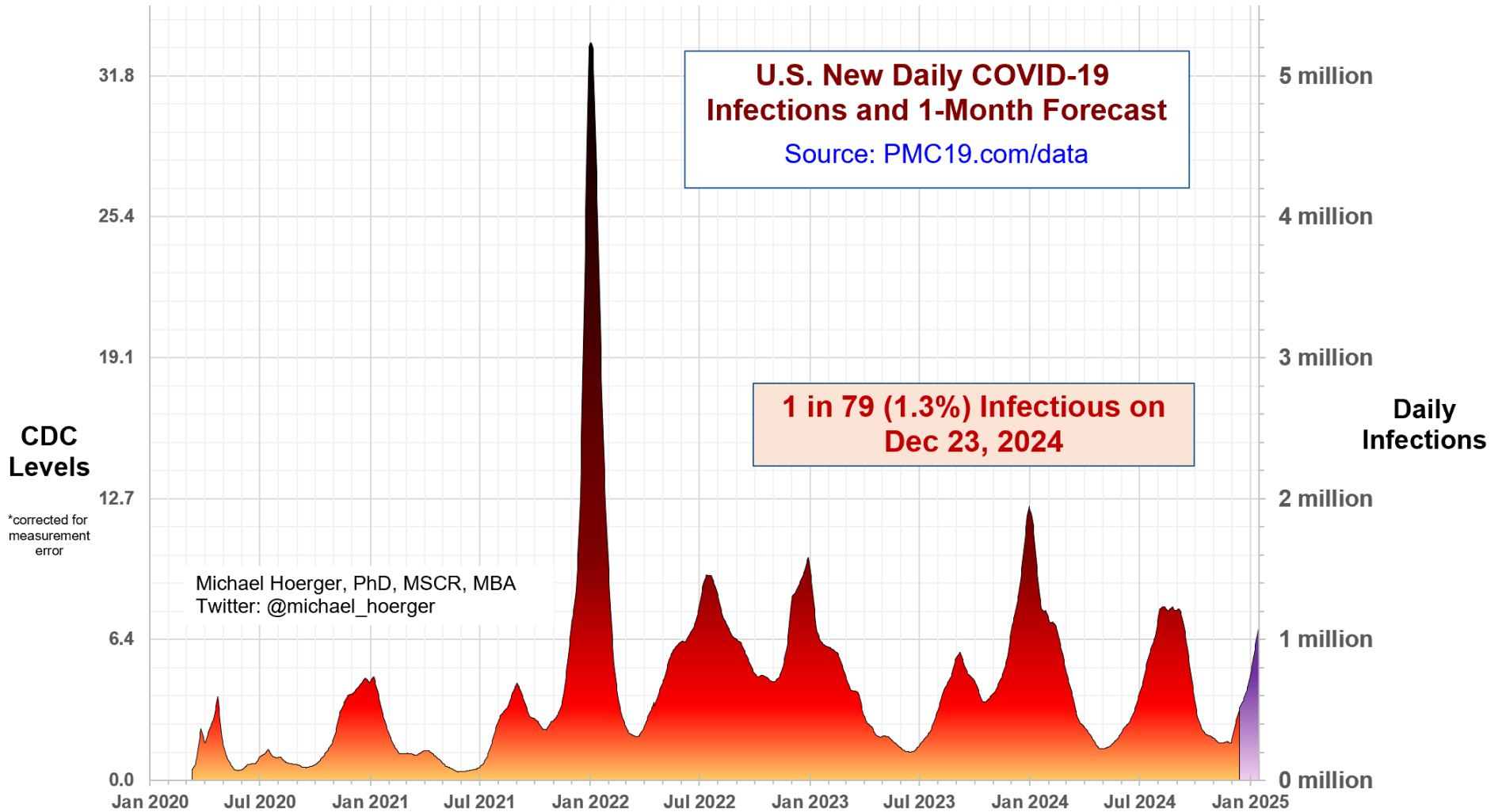


PMC U.S. COVID-19 Case Estimation and Forecasting Model: Report for December 23, 2024, pmc19.com/data

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



Cite as: Hoerger, M. (2024, Dec 23). *PMC U.S. COVID-19 Case Estimation and Forecasting Model: Report for December 23, 2024*. Pandemic Mitigation Collaborative. <http://www.pmc19.com/data>

Announcements

PMC Dashboard Survey: Please complete our quick survey about how you use this dashboard. The results will be used in a grant application documenting our public health impact and will hopefully help get additional funding for Covid mitigation supplies for patients with cancer. We would be pleased to share the results with other organizations interested in making the case that people continue to take Covid seriously and that more funds are needed for outreach and supportive activities. Findings will ultimately be published and document the high-level precautions many continue to use.

Survey Link: https://tulane.co1.qualtrics.com/jfe/form/SV_0okopCSxA26Mgxo

Letters of Support: We are aiming to expand our COVI-CAN program, which provides Covid Defense Kits (educational booklets, tests, masks, air purifiers) to patients with cancer and are seeking organizational letters in support of continued funding. Please reach out to Dr. Hoerger (mhoerger@tulane.edu) if potentially interested in helping, and we will make the process as easy as possible. Thank you.

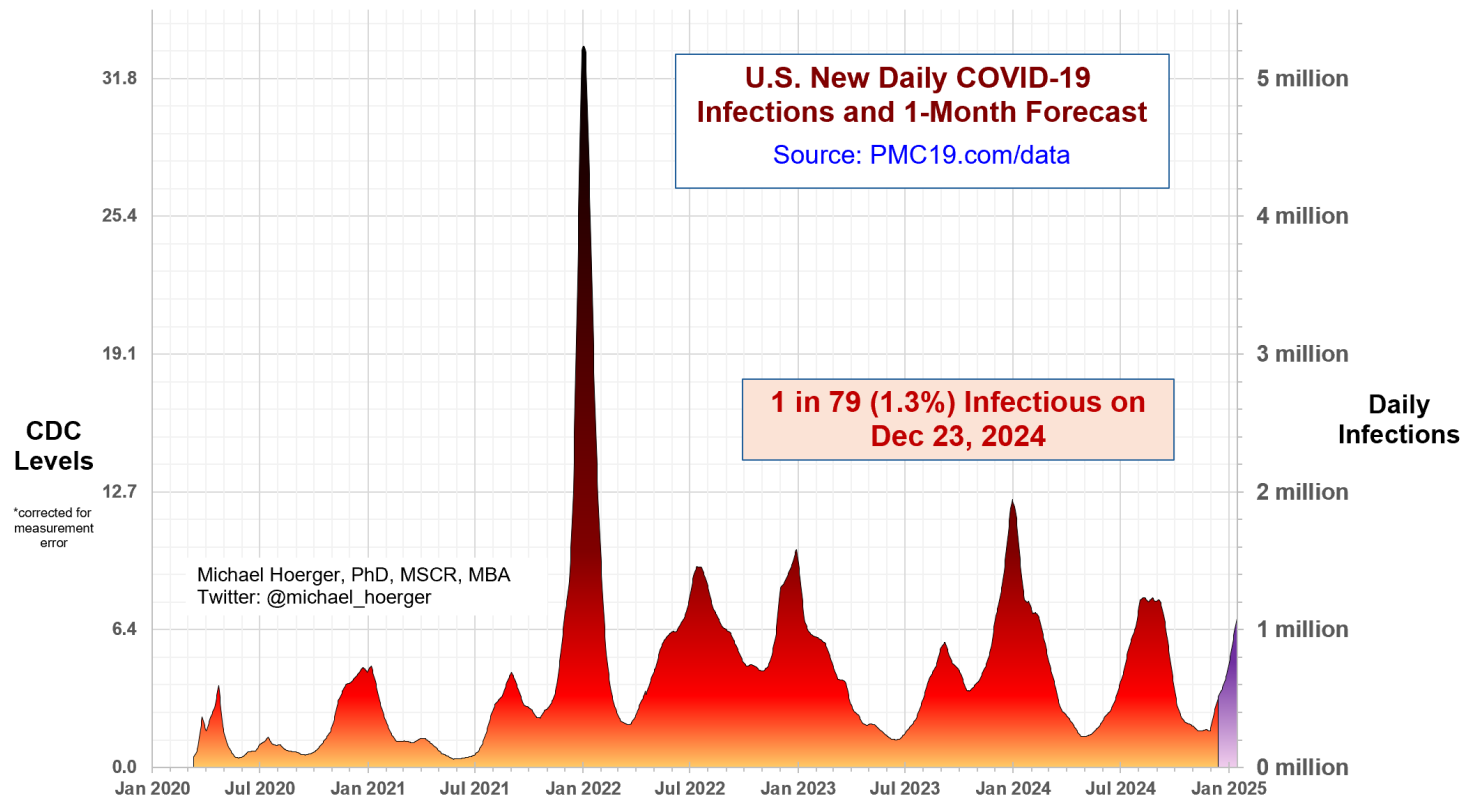
Project Link: <https://covican.com/>



The Big-Picture View of the Pandemic

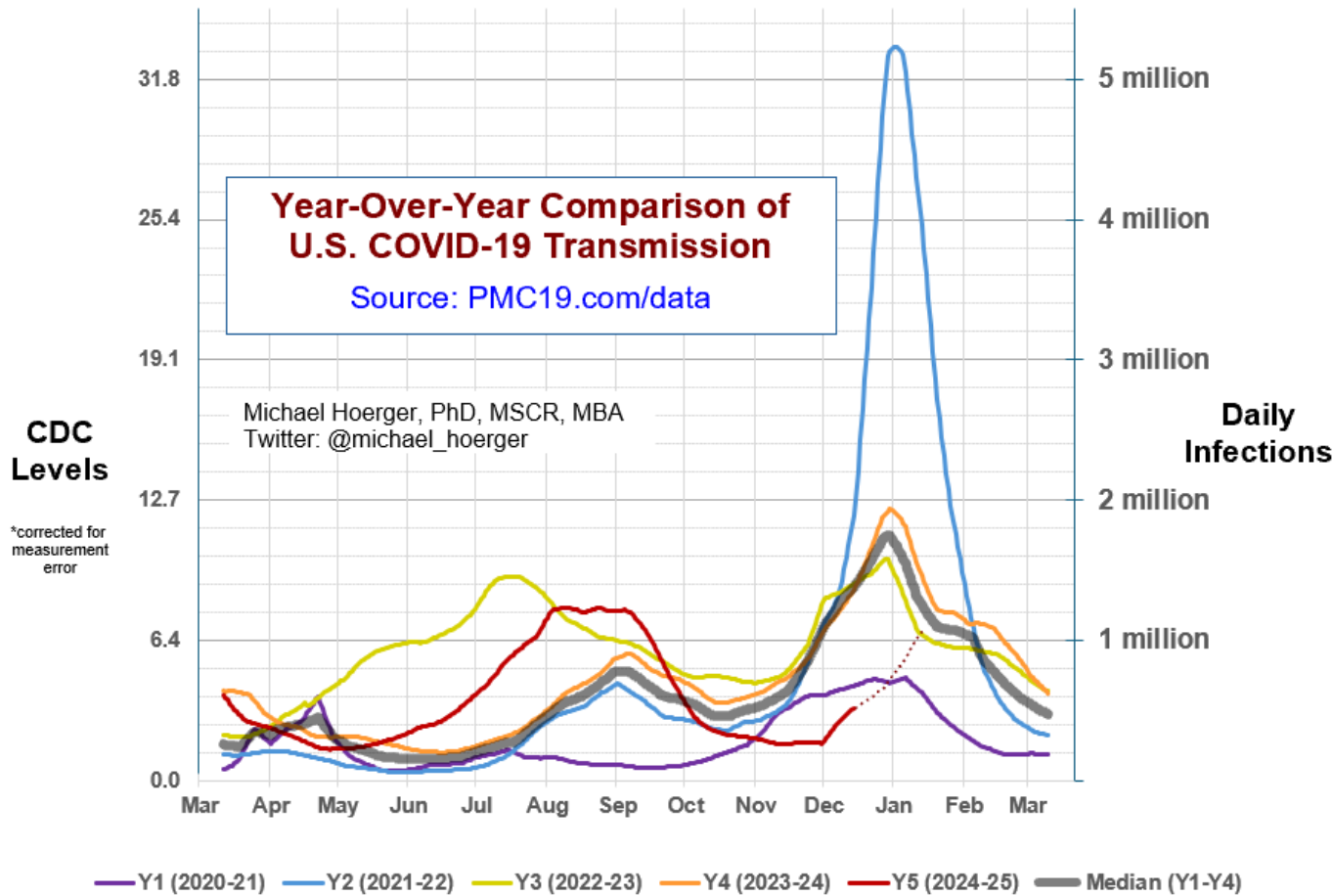
Many will be caught off guard by Covid infections this winter. Approximately 1.3% of the population is actively infectious with Covid. Last week's reported increase for the week of Nov 30-Dec 7 was the largest increase in nearly 3 years. The CDC's most recent data showed a smaller increase from Dec 7-14, but still sizable, and the WastewaterSCAN dashboard suggests continued increases in transmission on the way. During periods of rapid increases or decreases in transmission, our estimates will bounce around a bit because the "real time" estimates we provide for today are a >7-day forecast based on lagged CDC and Biobot data. Note that the current estimates are a little lower than suggested last week (1.3% versus 1.6%). They are anticipated to continue to rise and may be higher or lower than reported here once the fully retroactively-corrected data are in. In the U.S. last winter, the peak of winter transmission was approximately 7 days earlier in the corrected data than in the real-time data, and in Canada, the peak was nearly a month earlier corrected data than in real-time data. If those are generalizable trends rather than one-year aberrations,

transmission may be higher than suggested here and the peak earlier. The big-picture take-home is that we are in a Covid wave that is likely picking up, highly variable across regions, and that one may not realize they were in a high-transmission region until after the fact. General increases in precautions are advised.



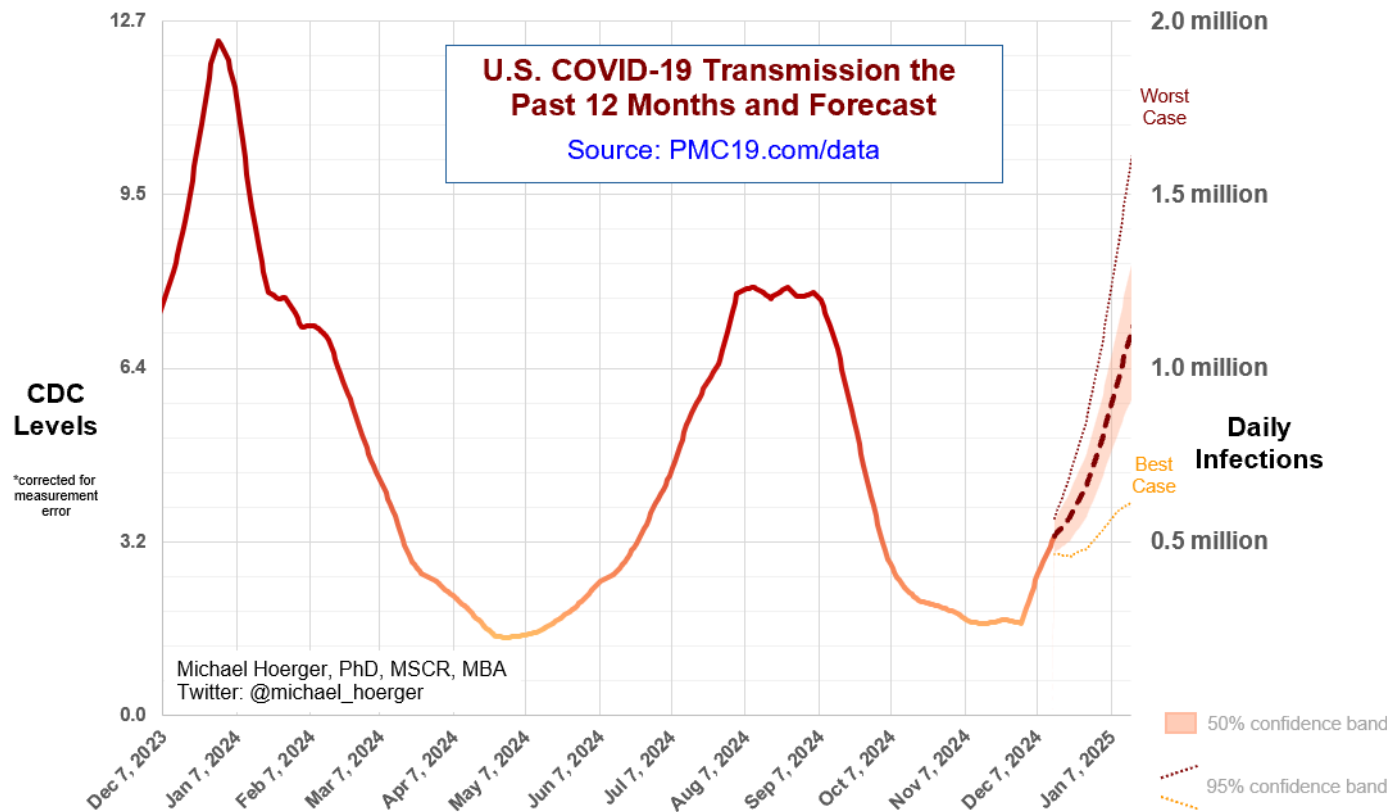
Year-Over-Year Comparisons

The year-over-year graph shows how the current winter wave departs from the pattern of prior years, with a high, flat, long summer wave, a steep post-summer-wave decline, an extended “lull,” and a later winter wave than usual. It remains to be seen whether we will pass the year 1 peak or reach closer to 1.1 million daily infections.



Close-up on the Current Forecast

This graph shows the best- and worst- case anticipated scenarios. A wave at this height and with this shape might be anticipated to level off and reach 600-700 thousand daily infections, but that appears unlikely given the activities of late December. More likely, transmission will hit 750,000 to 1,250,000 daily infections in early January. A worst-case scenario with retroactive upward adjustments, LP.8.1. taking off, and the west coast increasing more rapidly than expected would place the potential peak closer to 1.6 million daily infections. Likely, this is a medium-sized wave, currently looking like the 5th highest of 10, but there is still much uncertainty.



Supplemental Statistics

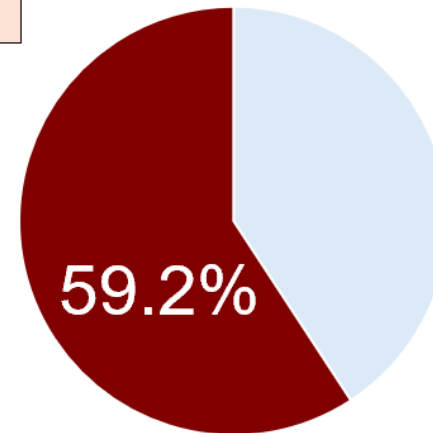
These supplemental statistics may prove useful in conversations about transmission and mitigation. The numbers have gotten substantially worse relative to last week. We see that 1 in 79 are actively infectious, or 1.3% of the population. In a university classroom of 50 people, it should be assumed that someone (about a 50% chance) has infectious COVID. On a flight of 100-300 people, that's a 72-98% chance someone is infectious. Transmission is higher than 59% of the pandemic and lower than 41% of the pandemic. We may see 27 million infections over the next months, if the middle estimate of the model holds.

Current Levels for Dec 23, 2024	
% of the Population Infectious	1.3% (1 in 79)
New Daily Infections	606,000
New Weekly Infections	4,242,000
Resulting Weekly Long COVID Cases	212,000 to 848,000

Monthly Forecast	
Average % of the Population Infectious	1.9% (1 in 53)
Average New Daily Infections	900,233
New Infections During the Next Month	27,007,000
Resulting Monthly Long COVID Cases	1,350,000 to 5,401,000

Running Totals	
Infections Nationwide in 2024	245,381,000
Average Number of Infections Per Person All-Time, U.S.	3.51

How Does Risk Increase with More Social Contacts?			
Number of People	Chances Anyone Is Infectious	Number of People	Chances Anyone Is Infectious
1	1.3%	15	17.4%
2	2.5%	20	22.5%
3	3.8%	25	27.3%
4	5.0%	30	31.8%
5	6.2%	35	36.0%
6	7.4%	40	40.0%
7	8.5%	50	47.2%
8	9.7%	75	61.6%
9	10.8%	100	72.1%
10	12.0%	300	97.8%



There is more COVID-19 transmission today than during 59.2% of the pandemic.

Assumes no testing/isolation protocols (U.S. only)
 pmc19.com/data

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


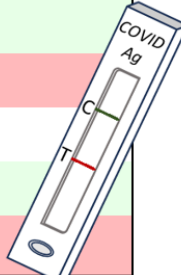
Holiday Estimates

Here are some estimates for plausible scenarios for Christmas and New Year’s Eve. Last year, we posted these much earlier because transmission patterns closely followed the median or “typical” patterns of transmission. With this year following an atypical pattern of transmission, it was wiser to hold off in posting. Note, these tables assume the likelihood of exposure (not necessarily infection) under circumstances where people are not testing or isolating. Consider them sort-of a base model. Testing and isolation policies reduce exposure risk. Vaccinations, masking, good indoor air quality, and limiting exposure time all help to reduce infection risk even when exposed.

PMC Christmas Day Forecast - December 25, 2024

How Does Risk Increase with More Social Contacts?

Number of People	Chances Anyone Is Infectious	Number of People	Chances Anyone Is Infectious
1	1.3%	15	18.1%
2	2.6%	20	23.4%
3	3.9%	25	28.3%
4	5.2%	30	33.0%
5	6.4%	35	37.3%
6	7.7%	40	41.3%
7	8.9%	50	48.6%
8	10.1%	75	63.2%
9	11.3%	100	73.6%
10	12.5%	300	98.2%

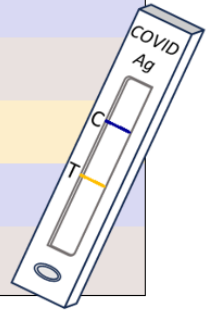
Assumes no testing/isolation protocols, forecasted 12/20/24 (U.S.)
pmc19.com/data

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

PMC New Year's Eve Forecast - Dec 31, 2024

How Does Risk Increase with More Social Contacts?

Number of People	Chances Anyone Is Infectious	Number of People	Chances Anyone Is Infectious
1	1.5%	15	20.8%
2	3.1%	20	26.8%
3	4.6%	25	32.2%
4	6.0%	30	37.3%
5	7.5%	35	42.0%
6	8.9%	40	46.4%
7	10.3%	50	54.1%
8	11.7%	75	68.9%
9	13.1%	100	78.9%
10	14.4%	300	99.1%



Assumes no testing/isolation protocols, forecasted 12/20/24 (U.S.)
pmc19.com/data

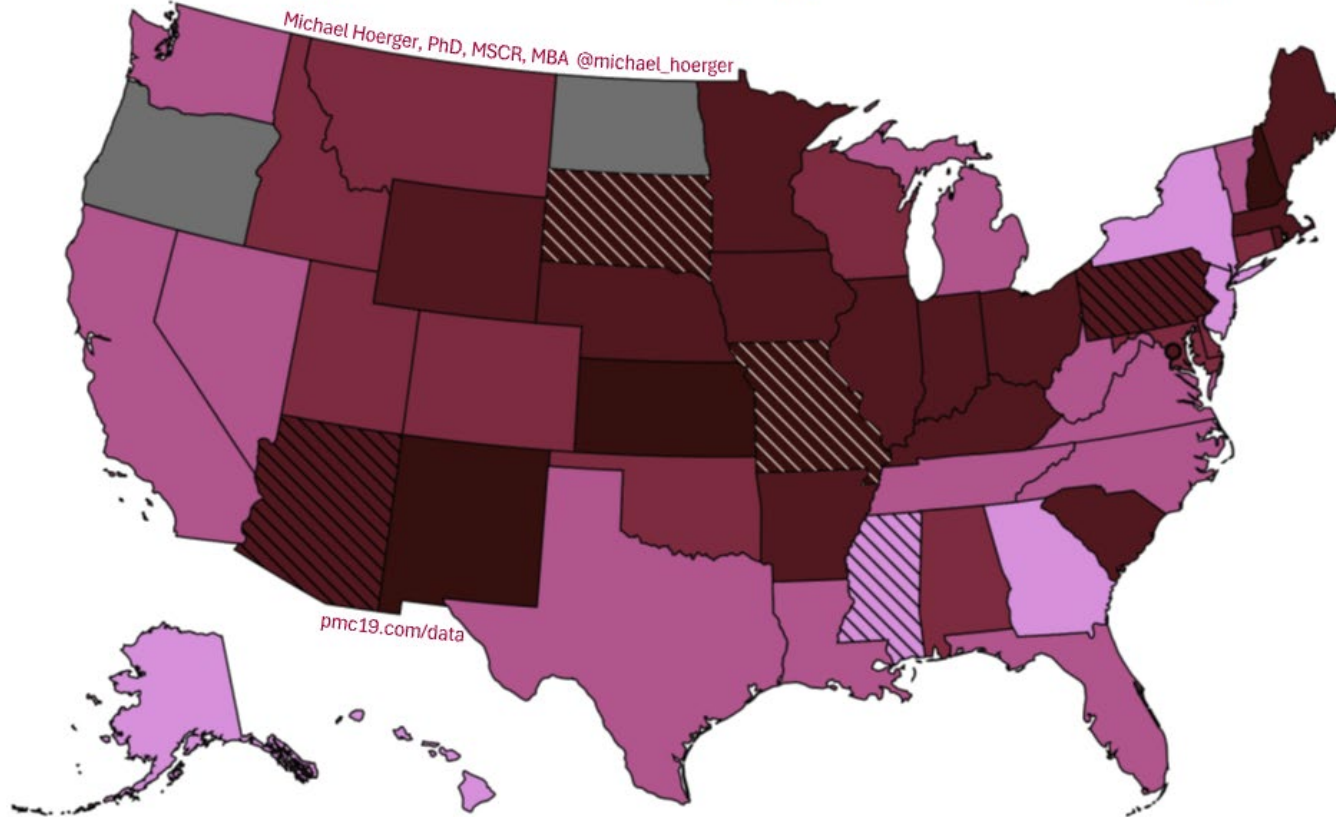
Michael Hoerger, PhD, MSCR, MBA
 Twitter: @michael_hoerger

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. Blue tends to 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>

COVID-19 Heat Map, CDC Data & Risk Levels, Higher Transmission in Deeper Red



Regional Case Estimation

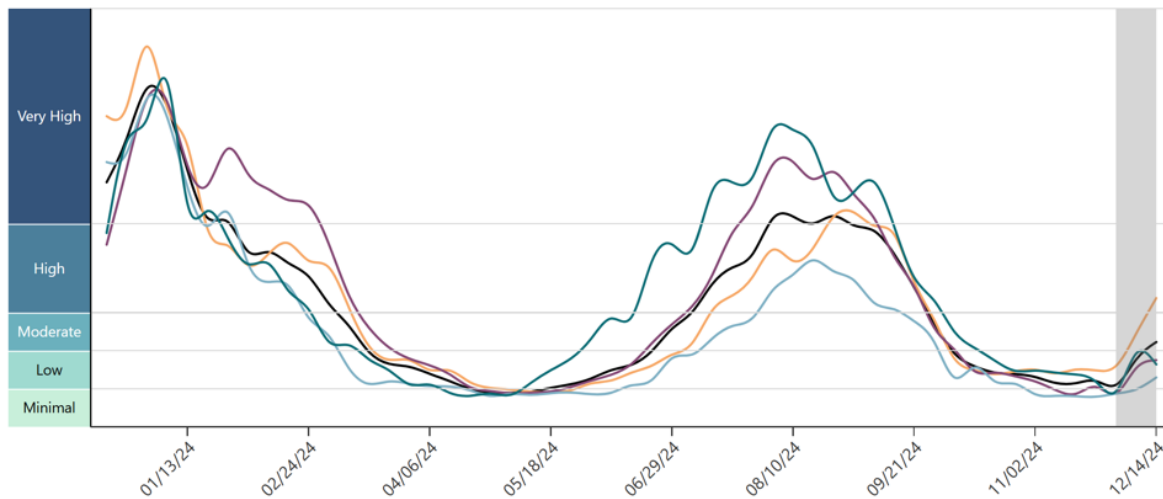
This graph from the CDC shows regional variation in transmission. You can use the “PMC Regional Multiplier” to get a ballpark estimate the proportion of a given region actively infectious with COVID-19 (see Technical Appendix document on the dashboard page).

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 1.3% (1 in 79)	1.1% (1 in 91)
	Northeast 0.7% (1 in 136)	0.6% (1 in 156)
	Midwest 1.9% (1 in 52)	1.7% (1 in 60)
	South 1.0% (1 in 100)	0.9% (1 in 116)
	West 0.9% (1 in 107)	0.8% (1 in 124)

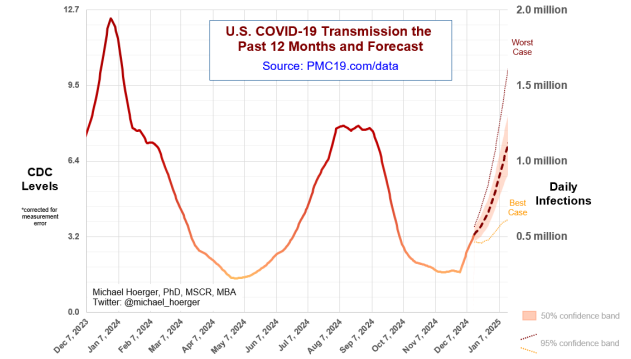
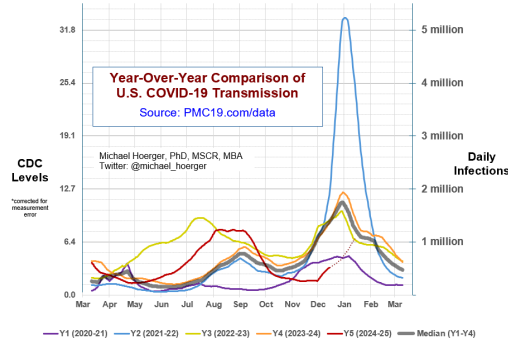
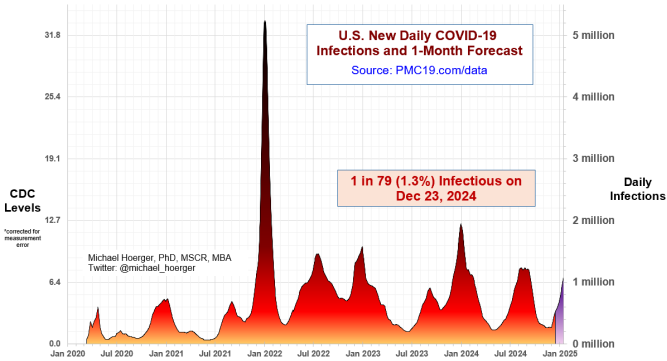
PMC Regional Multiplier*
0.329

* 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 those data by accounting for reporting time lag.

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



Current Levels for Dec 23, 2024

% of the Population Infectious	1.3% (1 in 79)
New Daily Infections	606,000
New Weekly Infections	4,242,000
Resulting Weekly Long COVID Cases	212,000 to 848,000

Monthly Forecast

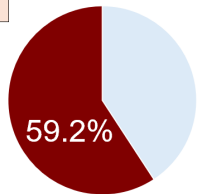
Average % of the Population Infectious	1.9% (1 in 53)
Average New Daily Infections	900,233
New Infections During the Next Month	27,007,000
Resulting Monthly Long COVID Cases	1,350,000 to 5,401,000

Running Totals

Infections Nationwide in 2024	245,381,000
Average Number of Infections Per Person All-Time, U.S.	3.51

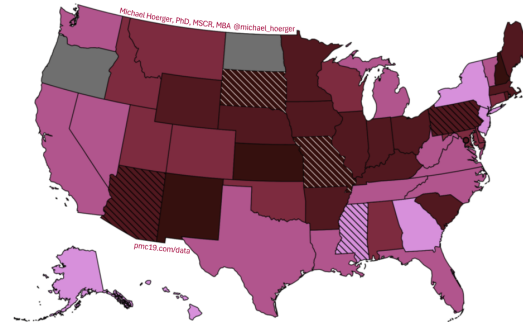
How Does Risk Increase with More Social Contacts?

Number of People	Chances Anyone Is Infectious	Number of People	Chances Anyone Is Infectious
1	1.3%	15	17.4%
2	2.5%	20	22.5%
3	3.8%	25	27.3%
4	5.0%	30	31.8%
5	6.2%	35	36.0%
6	7.4%	40	40.0%
7	8.5%	50	47.2%
8	9.7%	75	61.6%
9	10.8%	100	72.1%
10	12.0%	300	97.8%

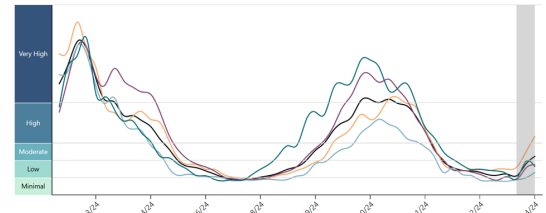


There is more COVID-19 transmission today than during 59.2% of the pandemic.

COVID-19 Heat Map, CDC Data & Risk Levels, Higher Transmission in Deeper Red



CDC Regional Levels with PMC Estimates of the Percentage Actively Infectious



Estimated Percentage Actively Infectious*

	PMC Model	Raw CDC Data
National	1.3% (1 in 79)	1.1% (1 in 91)
Northeast	0.7% (1 in 136)	0.6% (1 in 156)
Midwest	1.9% (1 in 52)	1.7% (1 in 60)
South	1.0% (1 in 100)	0.9% (1 in 116)
West	0.9% (1 in 107)	0.8% (1 in 124)

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 those data by accounting for reporting time lag.

Assumes no testing/isolation protocols (U.S. only) | Michael Hoerger, PhD, MSCR, MBA | pmc19.com/data | Twitter: @michael_hoerger

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.wvltv.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.