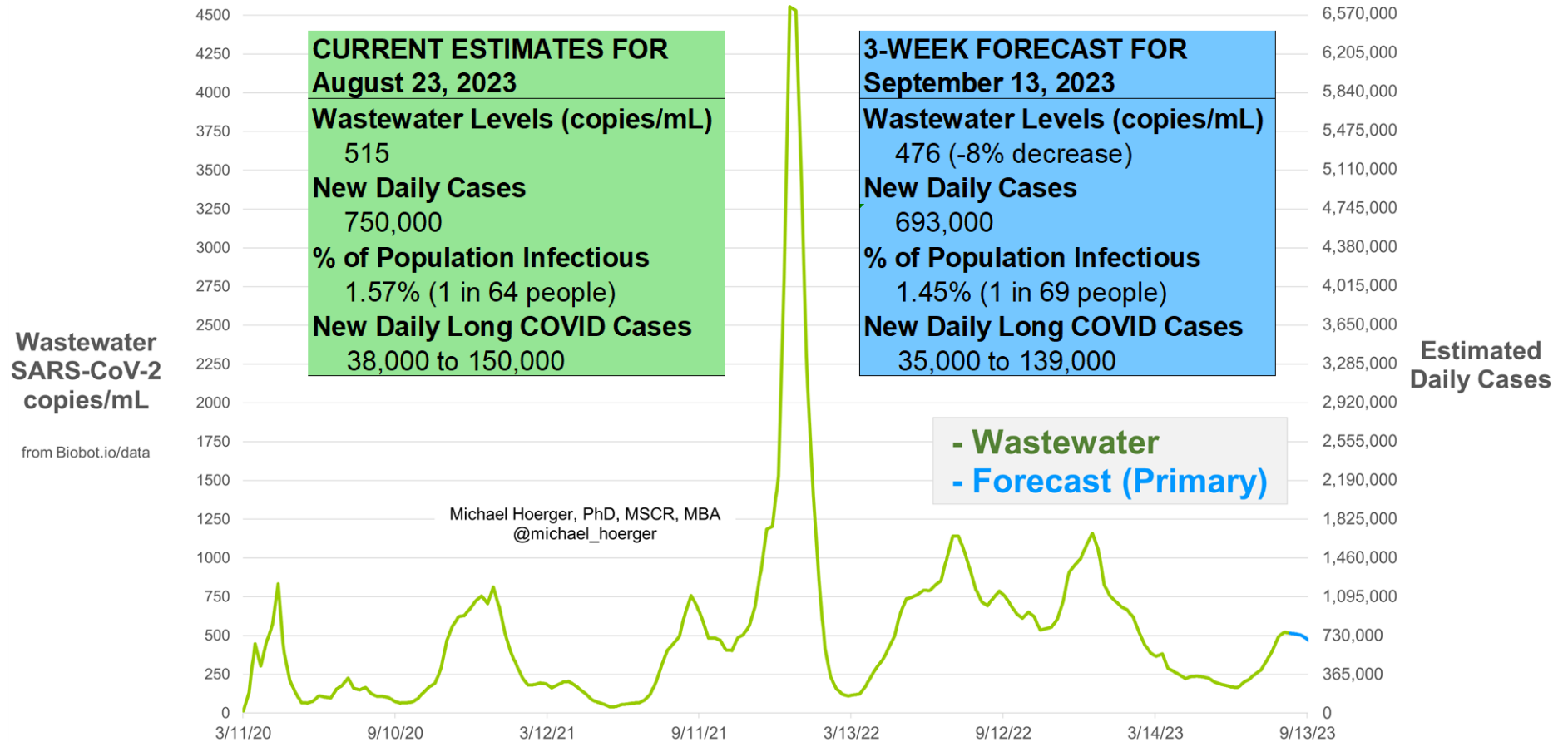


U.S. Wastewater Levels, Case Estimates, and 3-Week Forecast (PMC19.com)



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Informal Commentary:

U.S. #wastewater levels are higher than during the majority (59.4%) of the pandemic:

- ◆ 1.57% (1 in 64 people) are infectious
- ◆ 750,000 new daily COVID-19 cases
- ◆ Causing 38,000 to 150,000 new #LongCOVID cases per day

More details...

Where Are We Going?

If the model holds, viral transmission is currently plateauing at a high rate. The infection and estimated Long COVID numbers remain staggering. It's a good time to move meetings remote, maintain or increase high-level precautions (mask more and better, get a booster if it's been put off, increase testing when exposed, assume ill and test when symptomatic). In a month, transmission may be a little lower than now, but still high. This is not "declaring victory" or "minimizing." The picture remains serious. However, the fewer people infected, disabled, or dead is always a good thing, and I think cause for some somber relief that hopefully we are not heading into a much steeper late-summer "surge." If 2023 follows prior years, transmission will be a little lower than now in September and October and pick up again November through January.

What's the Weekly Picture? How's 2023 Been So Far?

The PMC model estimates over 5 million U.S. COVID cases per week, leading to >250,000 weekly Long COVID cases. The PMC model estimates over 135 million U.S. COVID cases so far in 2023, leading to at least 6.7 million Long COVID cases so far this year. These estimates are, arguably, quite conservative (lower limit assumes 5% of cases result in Long COVID) and highly concerning. Another article published this week in Nature Medicine documents that too-often core elements of Long COVID persist, even at 2 years follow-up, and especially among people hospitalized during the acute illness phase. This is particularly troubling given that reinfections increase the likelihood of hospitalization.

Bowe, B., Xie, Y., & Al-Aly, Z. (2023). Postacute sequelae of COVID-19 at 2 years. *Nature Medicine*, 1-11.

WEEKLY ESTIMATES FOR August 23, 2023
New Weekly Cases 5,250,000
New Weekly Long COVID Cases 263,000 to 1,050,000

2023 CUMULATIVE ESTIMATES AS OF August 23, 2023
Total 2023 Cases To Date 135,625,000
Total 2023 Long COVID Cases To Date 6,781,000 to 27,125,000

What's the Risk in an Office or in a Classroom?

The office and classroom risks remain quite bad. In a group of 10 people (daycare, team meeting, etc.), there's nearly a 15% chance someone will have infectious COVID. In a group of 20-25 people (e.g., K-12 classroom, department meeting, busy hospital waiting room, etc.), there's about a 30% chance someone would have infectious COVID. In a university classroom of 40-50 people, it should be assumed someone has infectious COVID. This is quite troubling for instructors or students who mix time with multiple groups of classmates each week.

Not all classrooms and meetings are the same. Virtual meetings reduce risk close to zero. Outdoor meetings are often safer than indoors. Testing reduces risk, as do policies that encourage people to stay home when symptomatic. High-quality, well-fitting masks greatly reduce risk. Air quality monitoring and improved air cleaning reduce risk. Recent boosters reduce risk. It remains troubling that elected leaders and public health officials choose to model poor mitigation when ongoing risk is so high.

Number of People	Chances Anyone is Infectious	Number of People	Chances Anyone is Infectious
1	1.6%	25	32.6%
2	3.1%	30	37.7%
3	4.6%	35	42.5%
4	6.1%	40	46.8%
5	7.6%	50	54.6%
6	9.0%	75	69.4%
7	10.5%	100	79.4%
8	11.9%	150	90.6%
9	13.2%	200	95.7%
10	14.6%	300	99.1%
15	21.1%	400	99.8%
20	27.1%	500	>99.9%

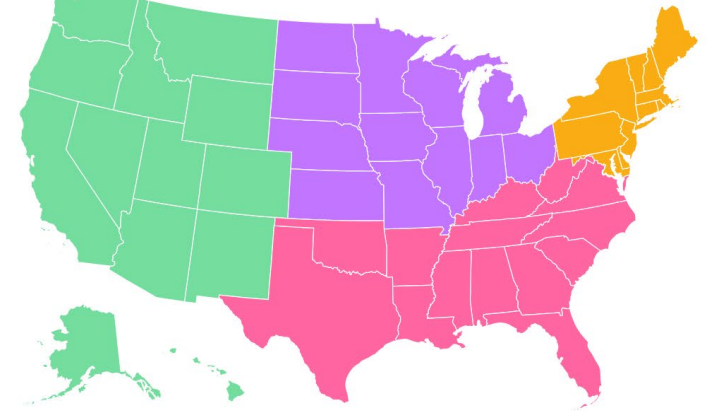
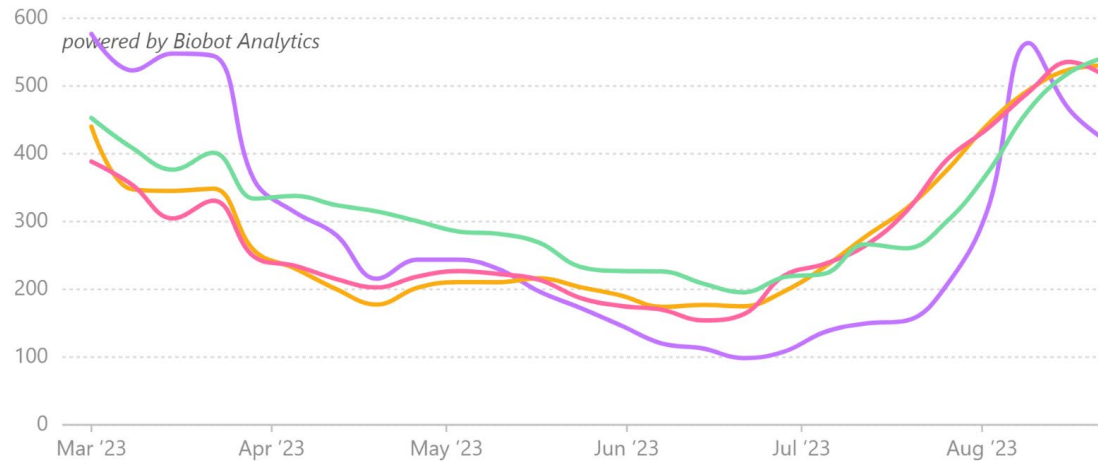
What's Going on in the "Midwest"?

The past two weeks, I cautioned that people were over-dramatizing a potential "surge" in the Midwest. This week's regional data further bear out that conclusion.

Show nationwide average

Total results Last 6 months Last 6 weeks

Wastewater: Effective SARS-CoV-2 virus concentration (copies / mL of sewage)



Source: Wastewater data from Biobot Analytics

How is the Forecast Performing?

The forecast continues to perform extremely well. This section will comment on accuracy and three main caveats. Last's weeks model forecasted that we would have wastewater levels of 551 copies/mL today. Biobot corrected their August 16 real-time estimate downward from 540 to just 523 copies/mL, and today further corrected downward to 521 copies/mL. Today, we are at 515 copies/mL. Thus, the real-time forecast overestimated by 7.0%. Using the corrected data from earlier this week, the model estimated today's levels would be 522 copies/mL, an overestimate of 1.4%. Using the corrected data reported today, the model would have forecasted 518 copies/mL, an overestimate of just 0.6%. That's pretty good performance, especially given that we're in a dynamic phase. It's arguably much easier to be accurate when in a steady state than when transmission is accelerating or decelerating. Overall, the model continues to perform well.

Some caveats:

1) Real-time reporting from Biobot. If Biobot's real-time reports are biased in a particular direction, this will mislead the forecast in biased fashion. If prone to error in either direction, the forecast will just have more noise. After a couple weeks of correcting real-time wastewater levels upward, this week Biobot corrected their real-time report estimates downward. That's good news. We will continue to monitor real-time reports for bias, but at present, these issues seem pretty expectable. See last week's report for more commentary on this type of issue.

2) Schools. Many schools have already opened, but some are just opening soon. The current model does not do a good job of accounting for specific events (e.g., holidays, schools opening, popular indoor concert tours). It's based on the month of the year and the past 4 weeks of data. If there were something about schools opening this August/September that differed markedly from the past couple years, that would be cause for concern. That does not seem to be the case, but see caveat #3.

3) Variants. For the 1st time, we've got 6 different Omicron variants/subvariants circulating at >10% each in the U.S. See Biobot.io/data graphs of variant data. From a modeling perspective, I suspect this reduces random error in the model in the near-term (nothing new can explode with that much competition). However, over the long-term, we are in uncharted territory. This is why I continue to say that nobody knows what the state of the pandemic will be two months into the future.

