

Modeling & Forecasting COVID-19 in NM

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September 14, 2021

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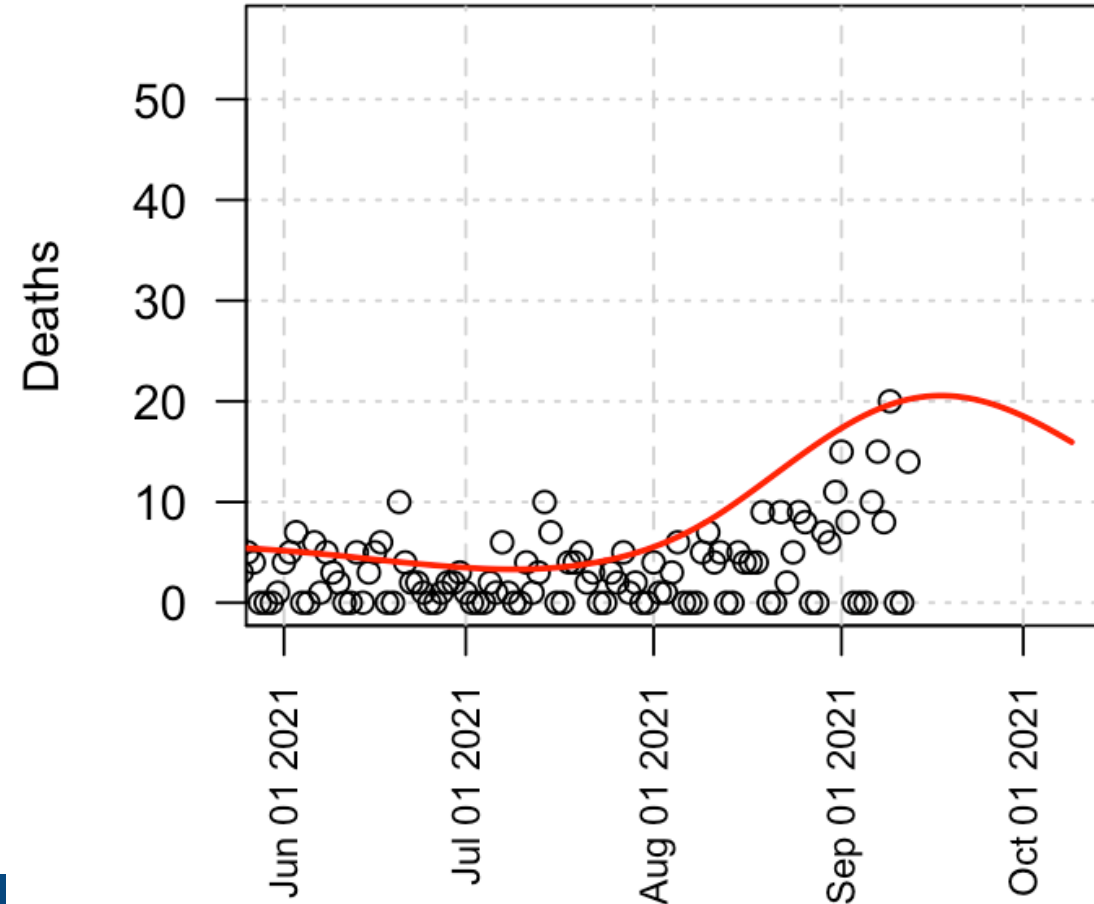
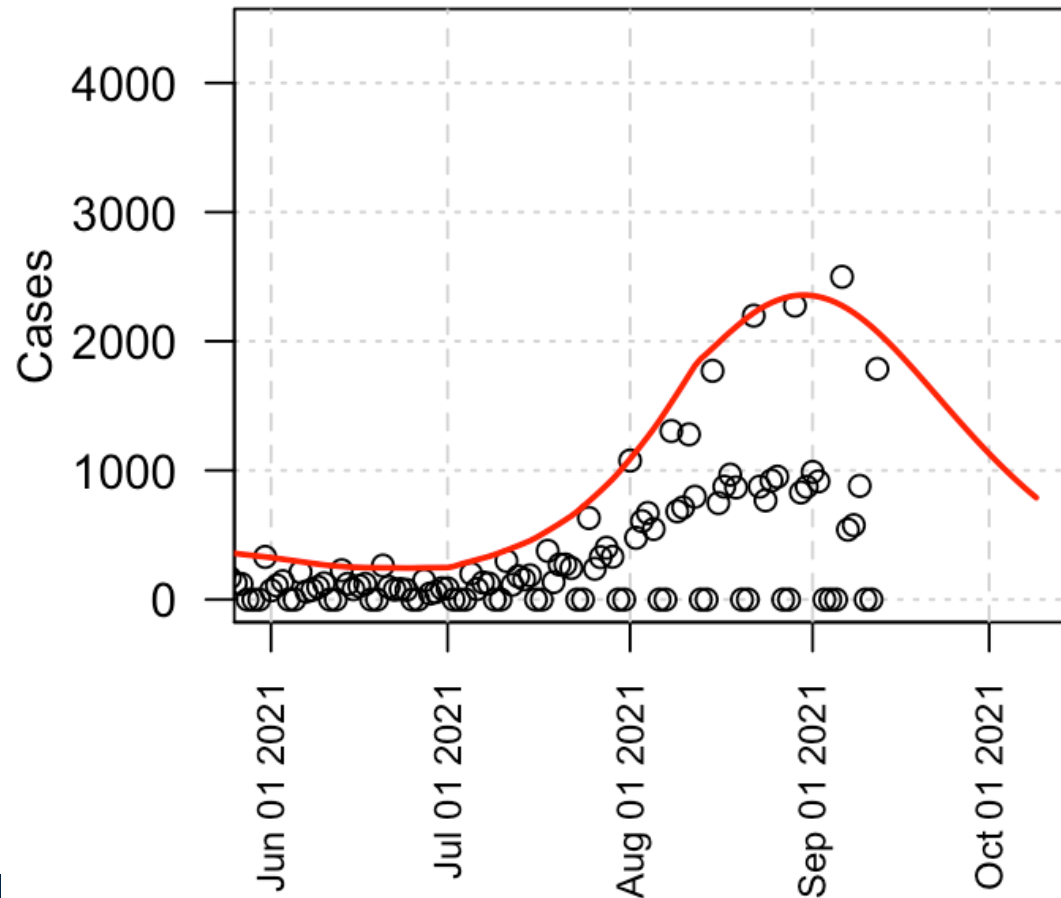
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14 Sept 2021: EpiGrid modeling

- Statewide NM daily incidence is declining. The red curve may not capture the full benefit of the masking order.
- High daily incidence might still be impairing some mitigations (i.e. tracing, followed by quarantine or isolation).
- Testing positivity rates are improving.
- NM daily deaths will likely peak in September.

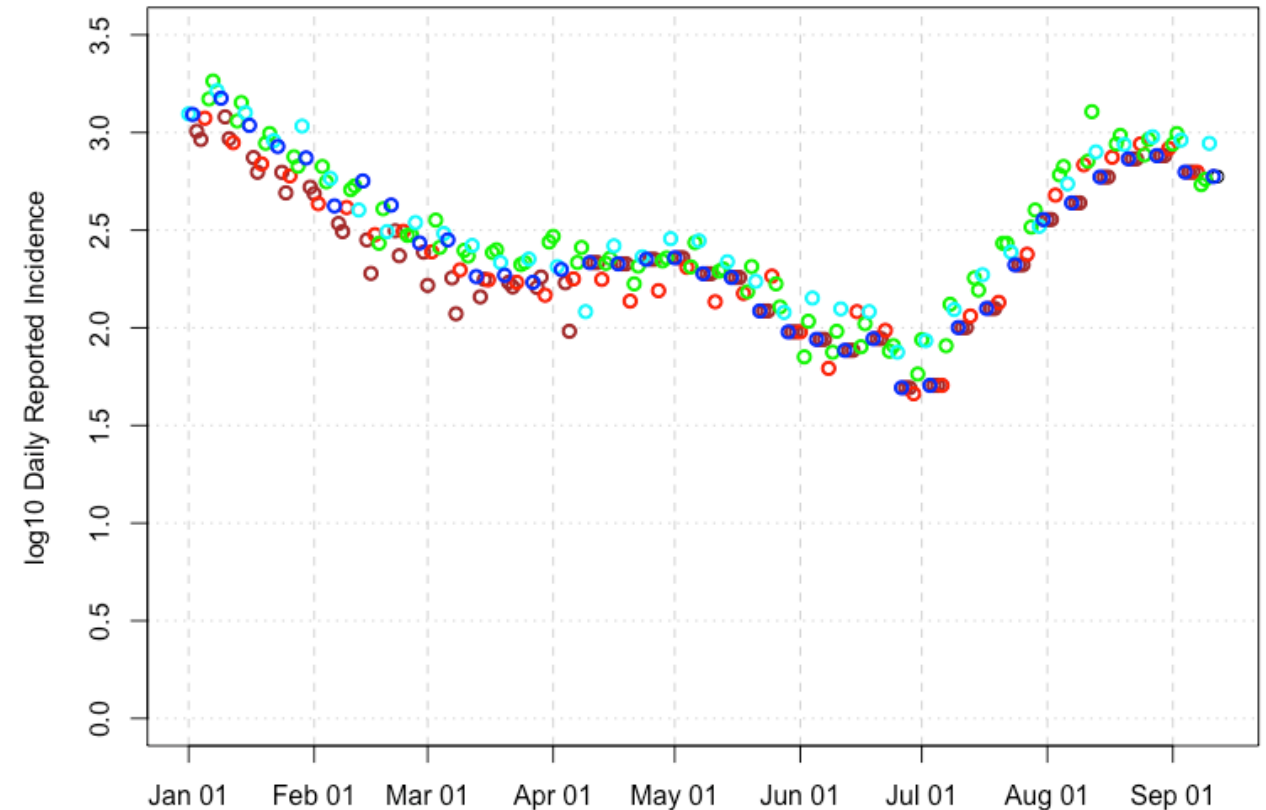
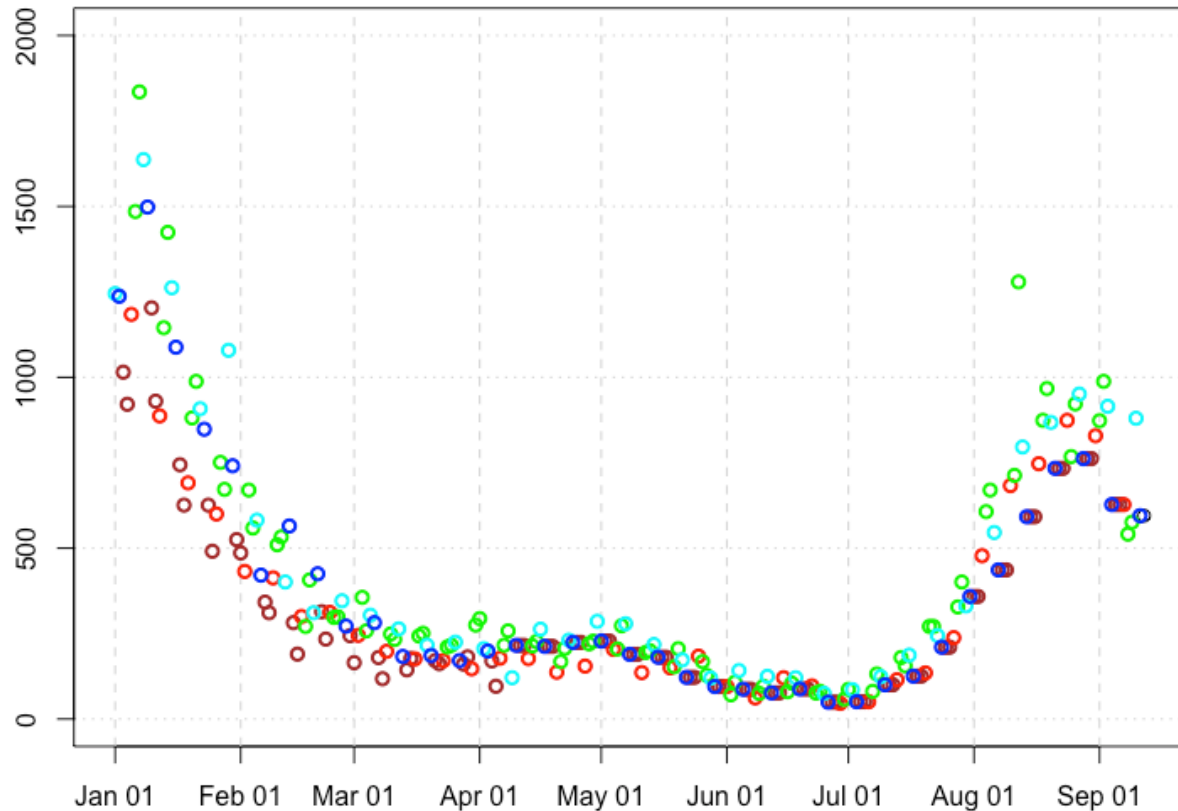


A look at the raw incidence data

- Sunday, Monday
- Tuesday
- Wednesday/Thursday
- Friday
- Saturday

Cases rates are *falling* due to mitigations.

The 190 cases in the Lea county correctional facility are removed from data reported on March 26th. The 1/3 of reported cases that were > 2 weeks prior were removed from March 24th. Case reported for weekends starting April 10-12th are each divided by 3 to estimate individual day counts.

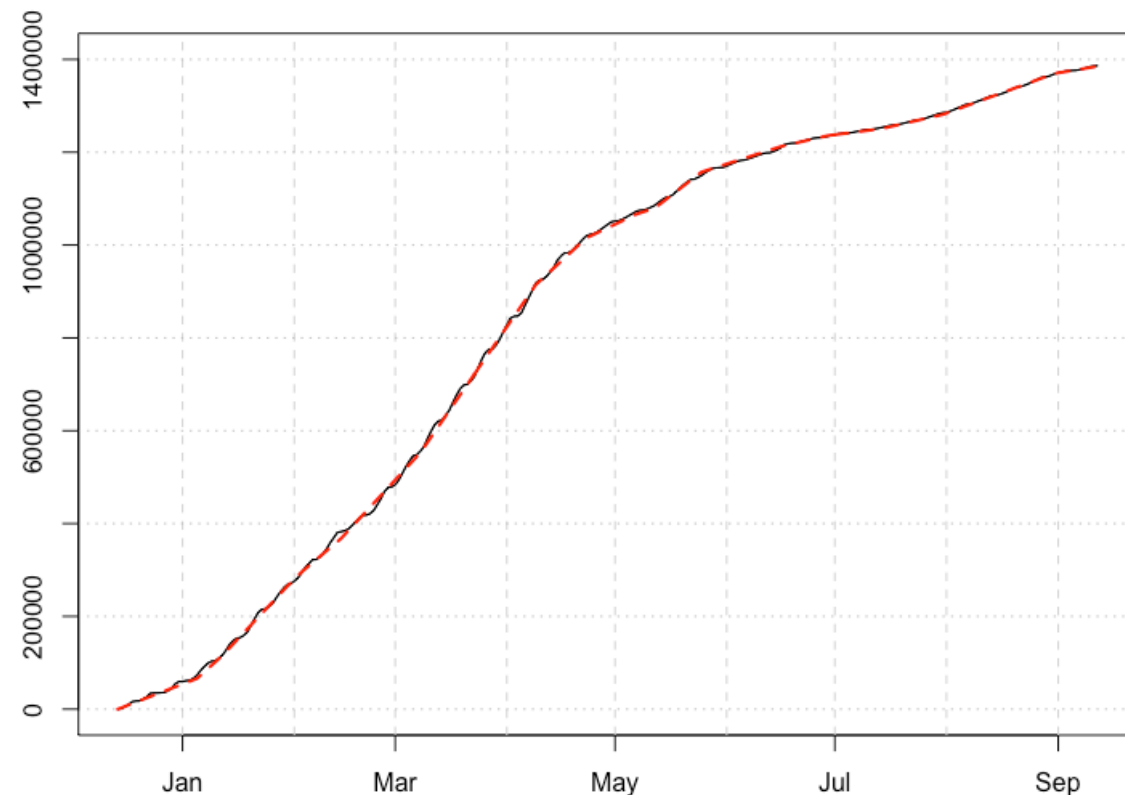


14 September 2021 Vaccine Analysis and Summary

- ~1385k first doses have been administered in NM.
 - ~1206k completed vaccine series in NM.
 - EpiGrid is modeling this as 1385k first doses.
 - ~66.1% of all persons in New Mexico are vaccinated.
-
- Federal vaccine orders will likely drive more rapid adoption in the near future.

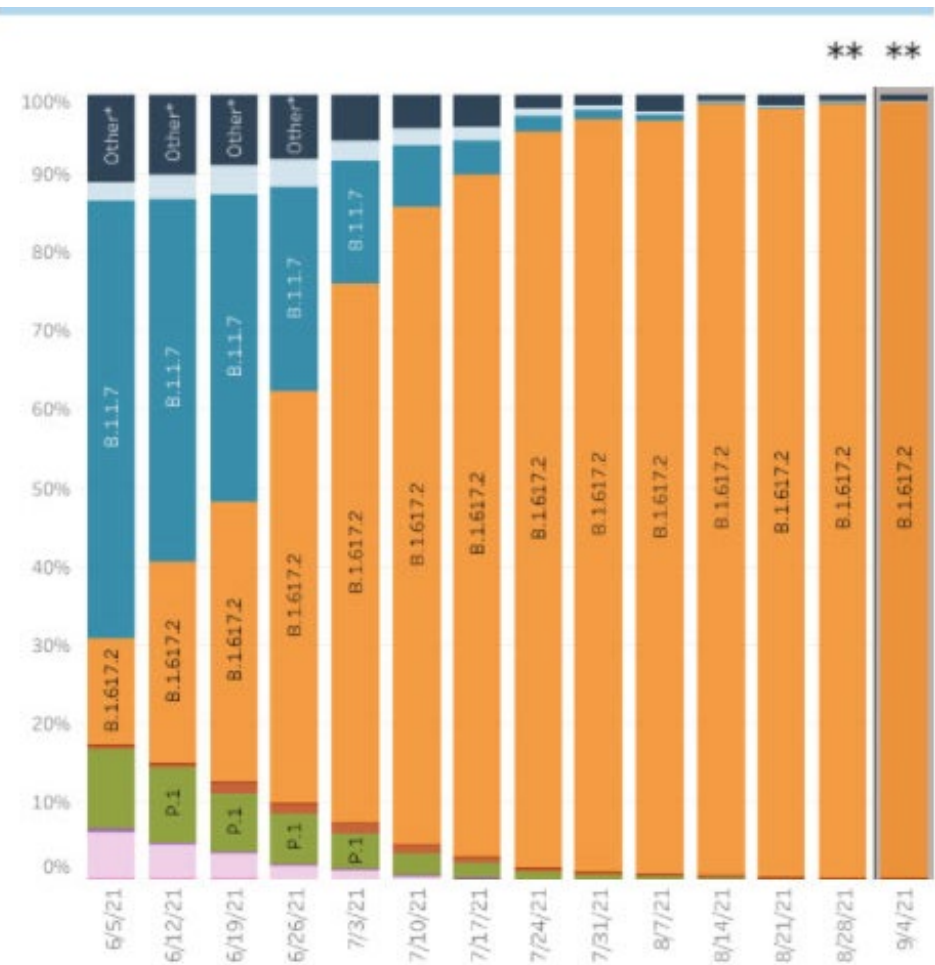
Black – vaccination for all New Mexicans

Red – First dose data used in EpiGrid.



Variants: Still Delta (for now, keep watching ...)

<https://www.cdc.gov/coronavirus/2019-ncov/covid-data/covidview/index.html>

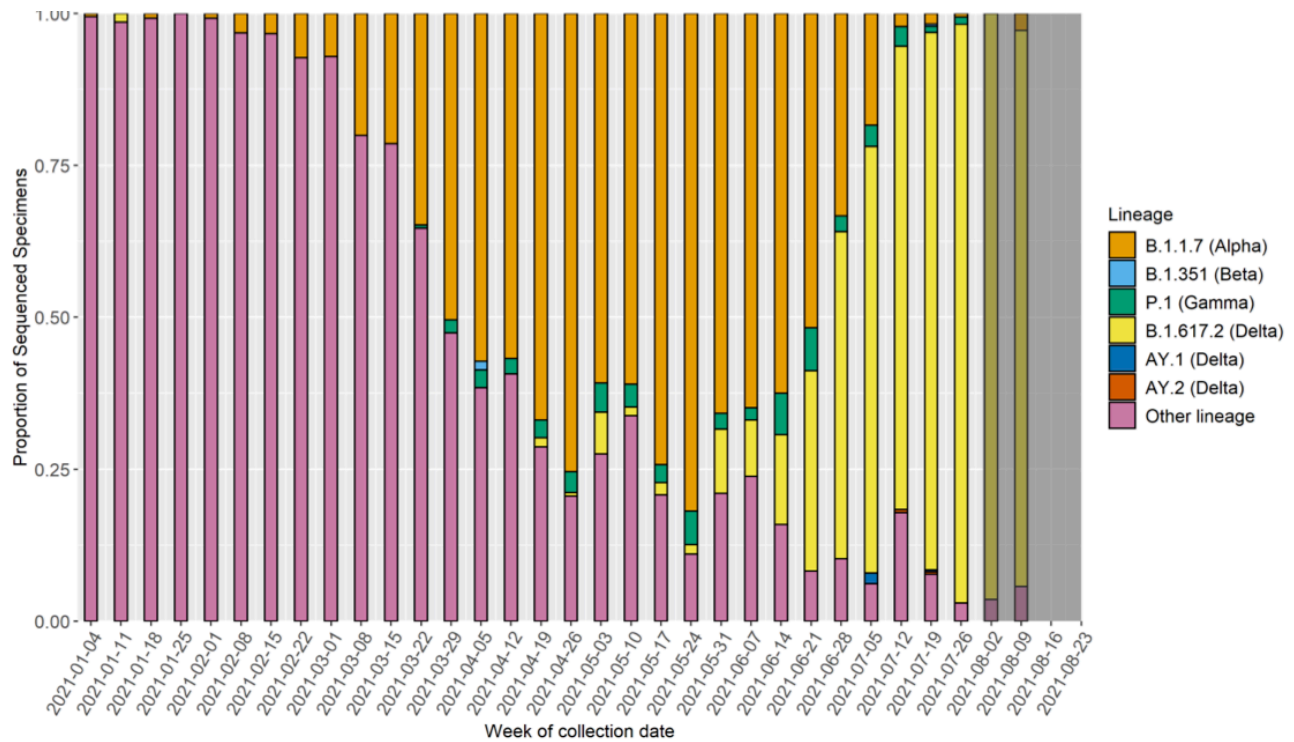


B.1.617.2, “ Δ ” is “Indian variant”

B.1.1.7, “ α ” is “UK variant”

Other variants are being reported in multiple countries.

New Mexico data likely still showing Delta dominant



https://www.cdc.gov/coronavirus/2019-ncov/covid-data/covidview/09102021/images/variants1_09102021.jpg?_=14903?noicon

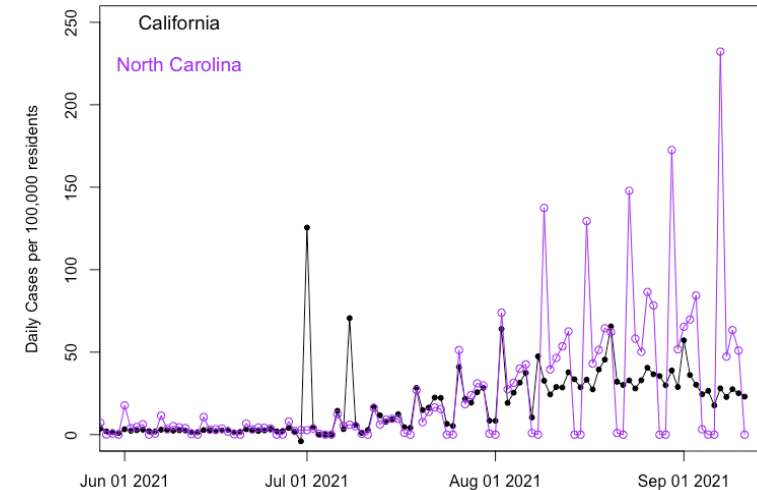
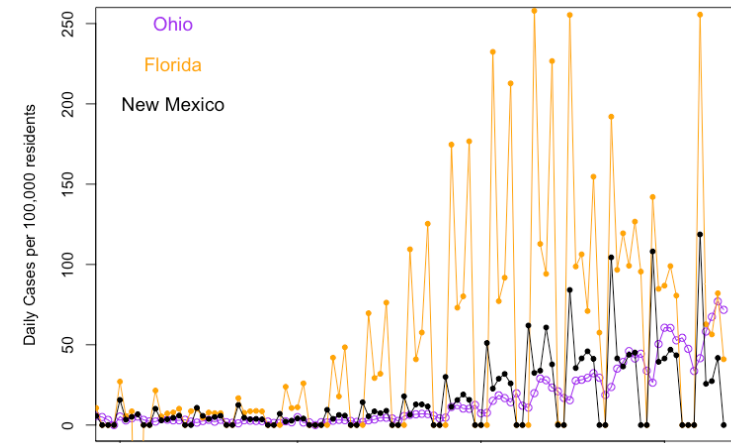
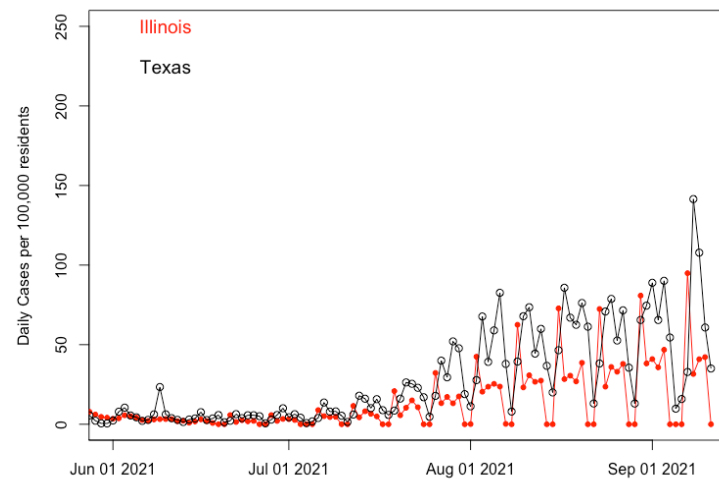
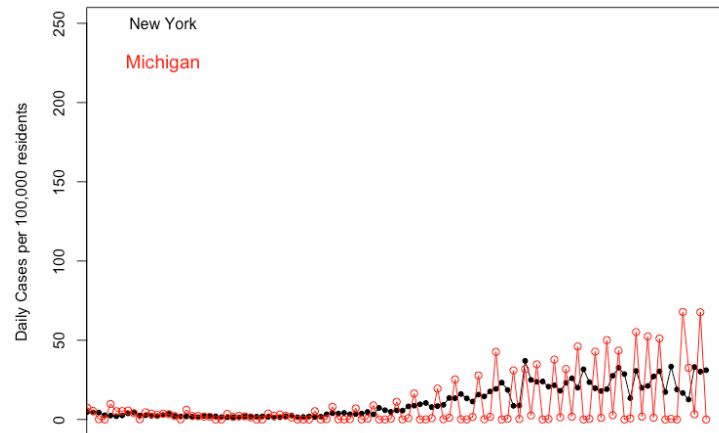
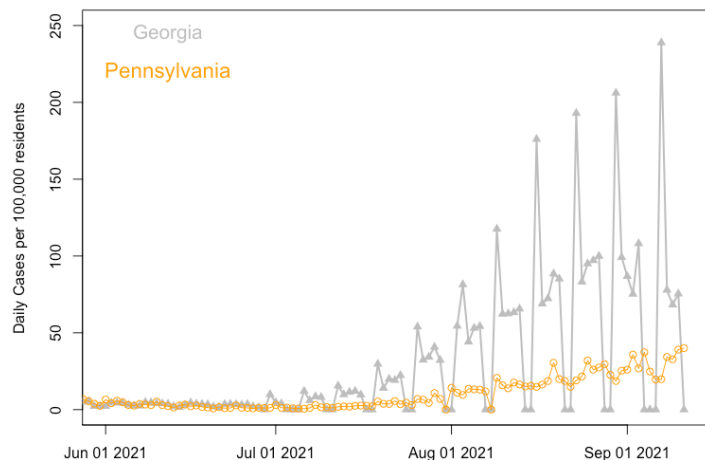
What is happening in the rest of the U.S.?

The 10 most populous states and New Mexico

Trends over the last 3 weeks: **Increasing:** Ohio, Pennsylvania. **Steady:** Illinois, Michigan, New York, Texas. **Modest Declines:** Florida (from a high baseline), North Carolina. **Declining:** California, Georgia, New Mexico.

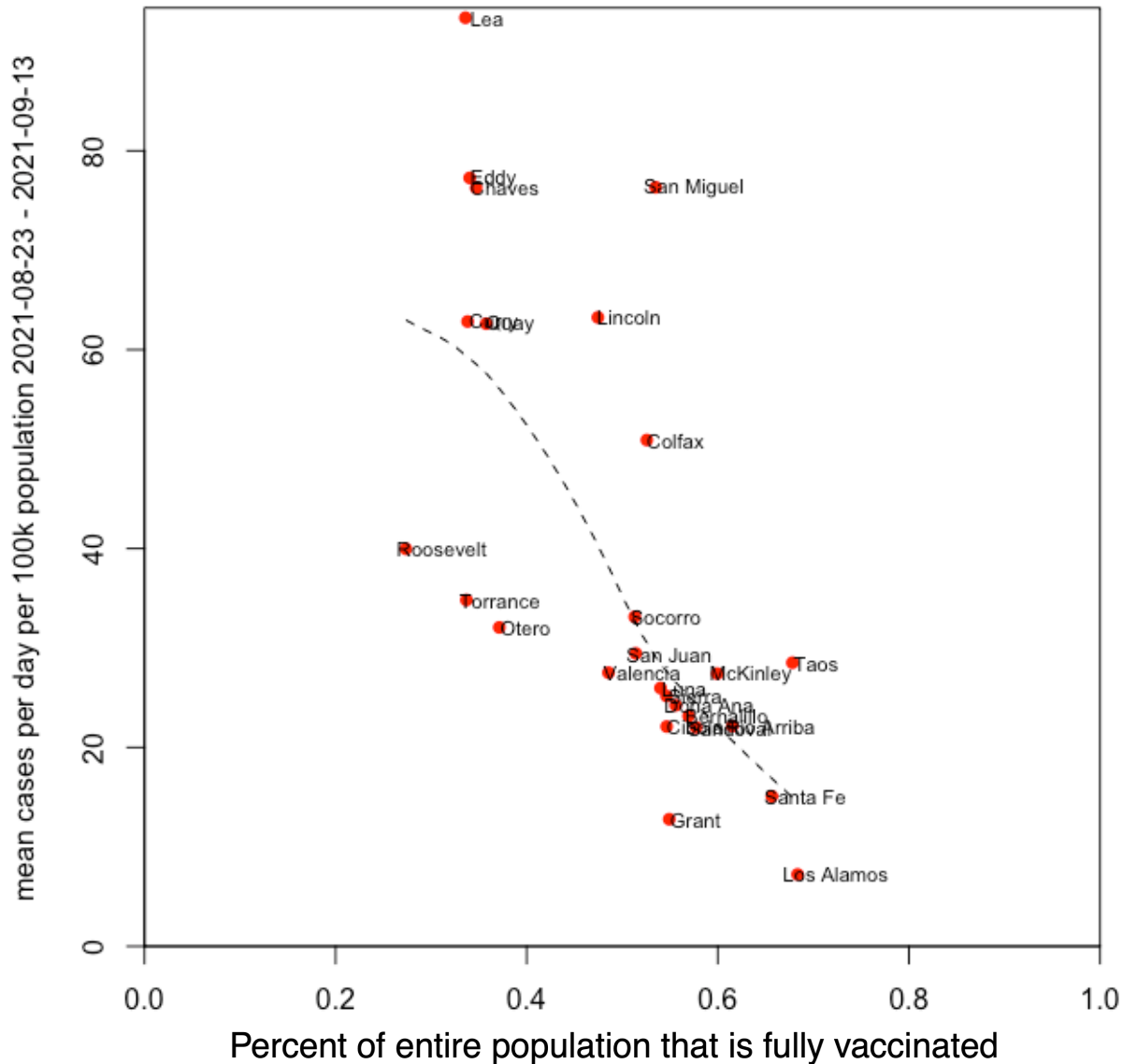
	Cases	Deaths
New York	25.14	0.18
Michigan	24.53	0.214
Ohio	56.74	0.252
Florida	71.12	1.594
New Mexico	30.51	0.36
Illinois	29.93	0.263
Texas	57.65	0.864
California	24.4	0.274
North Carolina	56.27	0.489
Georgia	65.78	0.785
Pennsylvania	30.06	0.208

Daily rates per 100,000 residents averaged August 30th thru September 10th 2021.



Any anticipated roll-over in cases is slow coming in this wave

Cases plotted versus vaccination by county

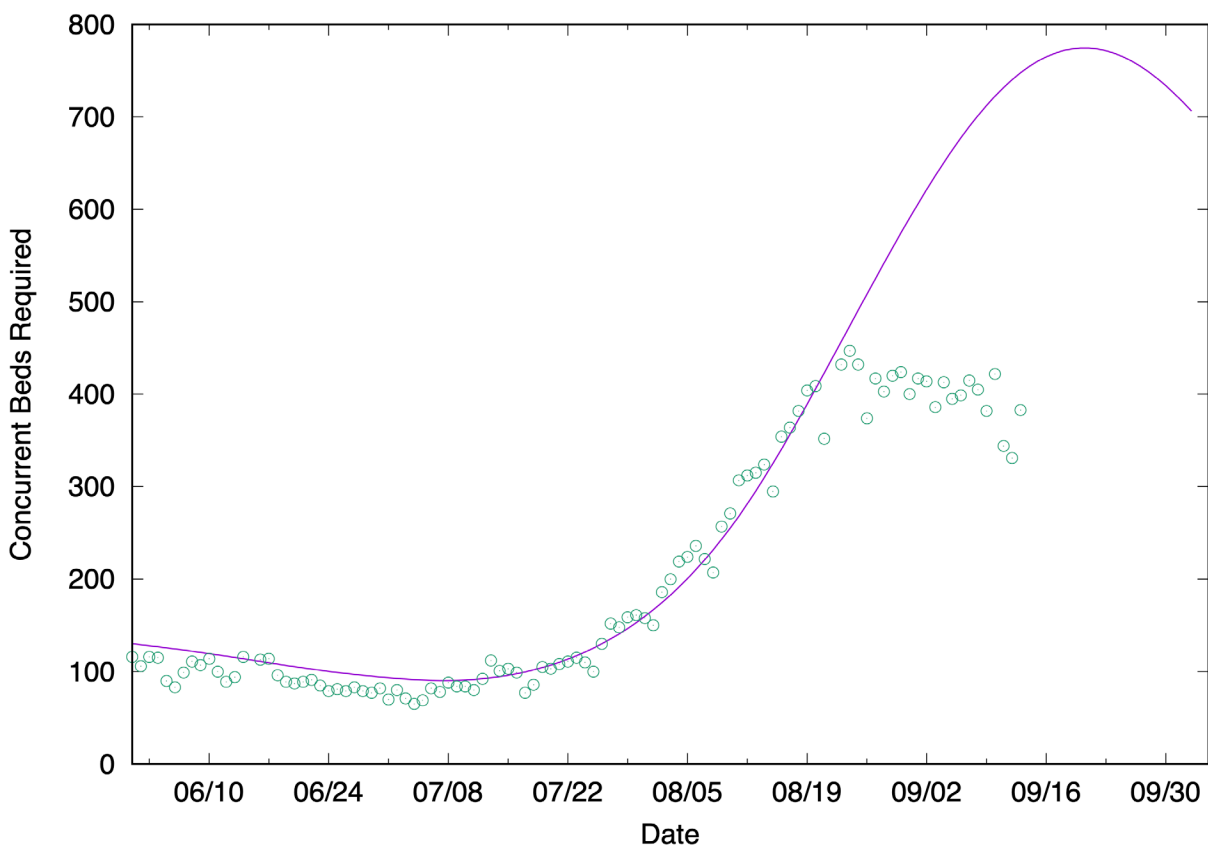


The relationship between vaccination and cases is strong and **highly** protective on a by-county basis.

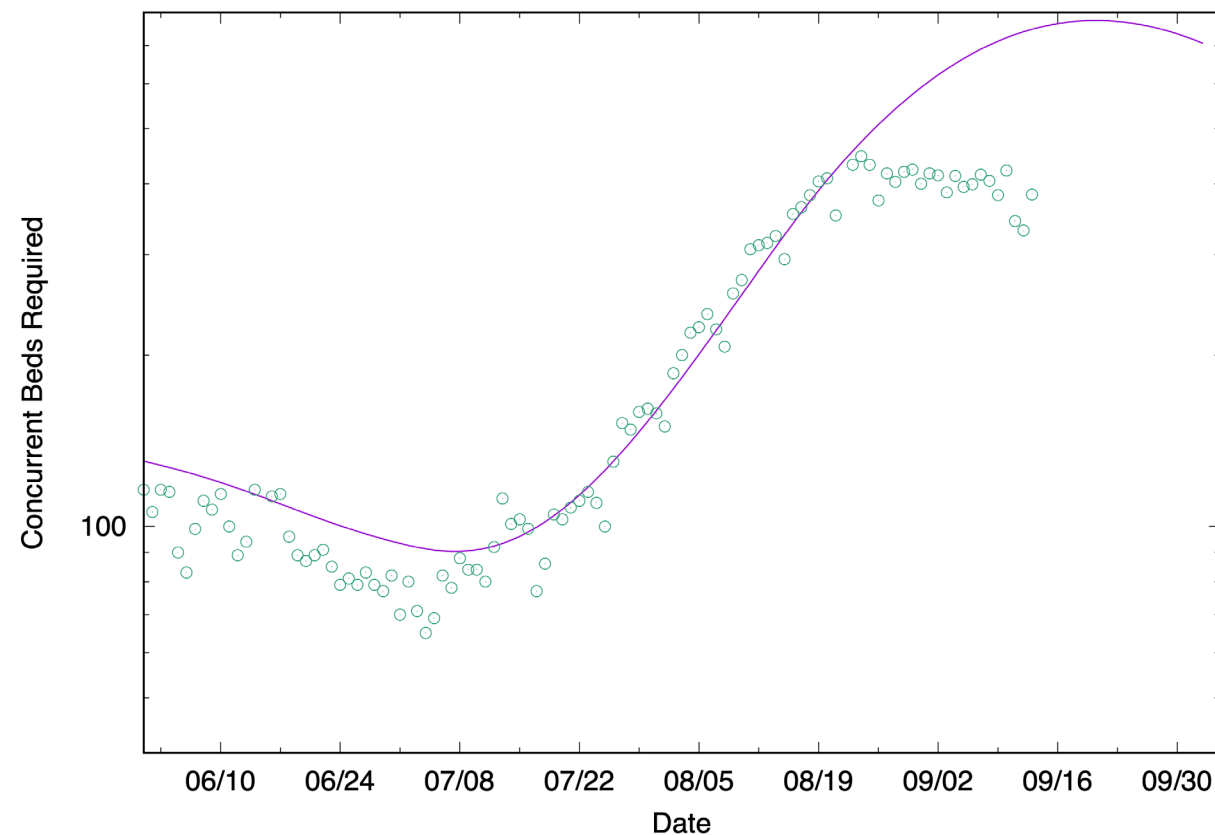
- Lea County incidence appears to be falling rapidly.
- San Miguel County is high incidence relative to middle vaccination adoption.
- Eddy, Chaves, Lincoln, Colfax, Taos are marginally high.
- Roosevelt, Torrance, Otero, Grant, Los Alamos have better than typical incidence compared to vaccination.
- Seven counties are not on this plot due to relative isolation and small populations: Catron, De Baca, Guadalupe, Harding, Hidalgo, Mora and Union.
- Based on county level data showing correlations between effective COVID-19 mitigation procedures and case rates, extrapolation says statewide daily reported cases would be ~300/day if similar mitigations and vaccination are implemented statewide.
- The observed excess in daily incidence will translate into increased deaths per day over the next month.

Hospital bed concurrent usage by COVID-19 patients (Statewide)

- Left panel: linear vs. time (y-scale = 0:800)
- Right panel: log vs. time (y-scale = 40:800, 20x)
- Deviation of the data below the model is evident beginning in late August.
- Concurrent bed utilization data reach their peak *before* the peak in daily incidence on approximately September 1st.
- Flattening of the hospital load data is due to improved disease outcomes or other factors not present from March through late July, 2021.



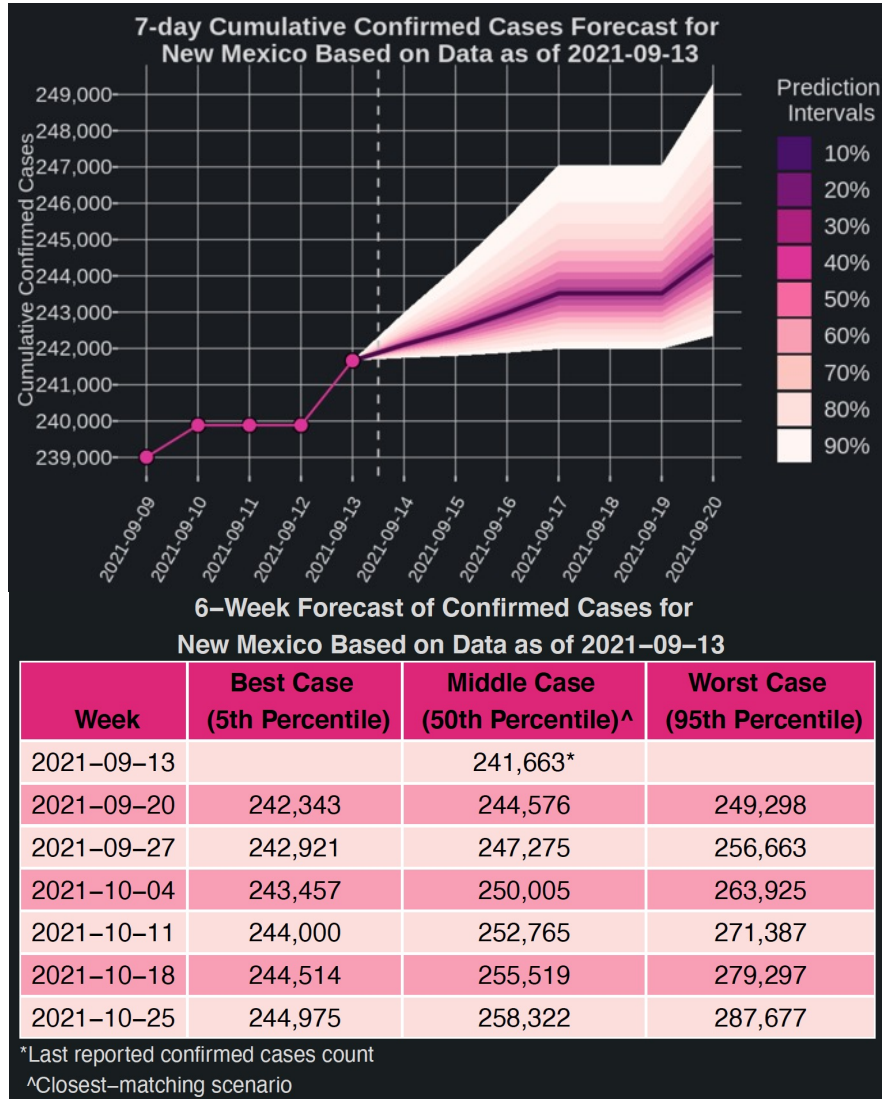
Tue Sep 14 10:39:00 2021



Tue Sep 14 10:39:24 2021

Short- & Long-Term Forecast for NM: Cases

Cumulative Cases



Daily Average

6-Week Forecast of Daily Average of Confirmed Cases for New Mexico Based on Data as of 2021-09-13

Week End Date	Best Case (5th Percentile)	Middle Case (50th Percentile) [^]	Worst Case (95th Percentile)
2021-09-13		896*	
2021-09-20	97	416	1,092
2021-09-27	82	389	1,055
2021-10-04	72	382	1,062
2021-10-11	67	382	1,093
2021-10-18	62	386	1,156
2021-10-25	55	389	1,247

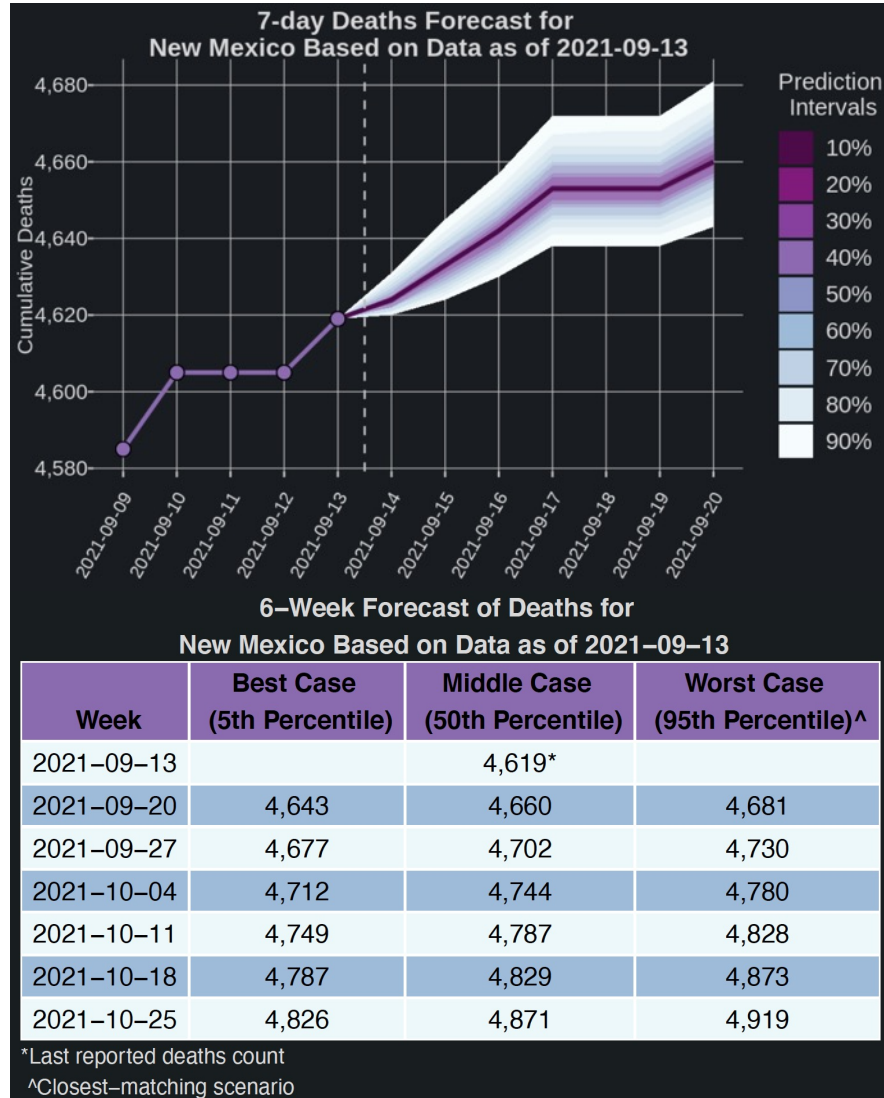
*Last reported confirmed cases count

[^]Closest-matching scenario

So what?
 Our model suggests that the number of daily cases is expected to be around 400 in the next few weeks (middle case scenario)

Short- & Long-Term Forecast for NM: Deaths

Cumulative Cases



Daily Average

6-Week Forecast of Daily Average of Deaths for New Mexico Based on Data as of 2021-09-13

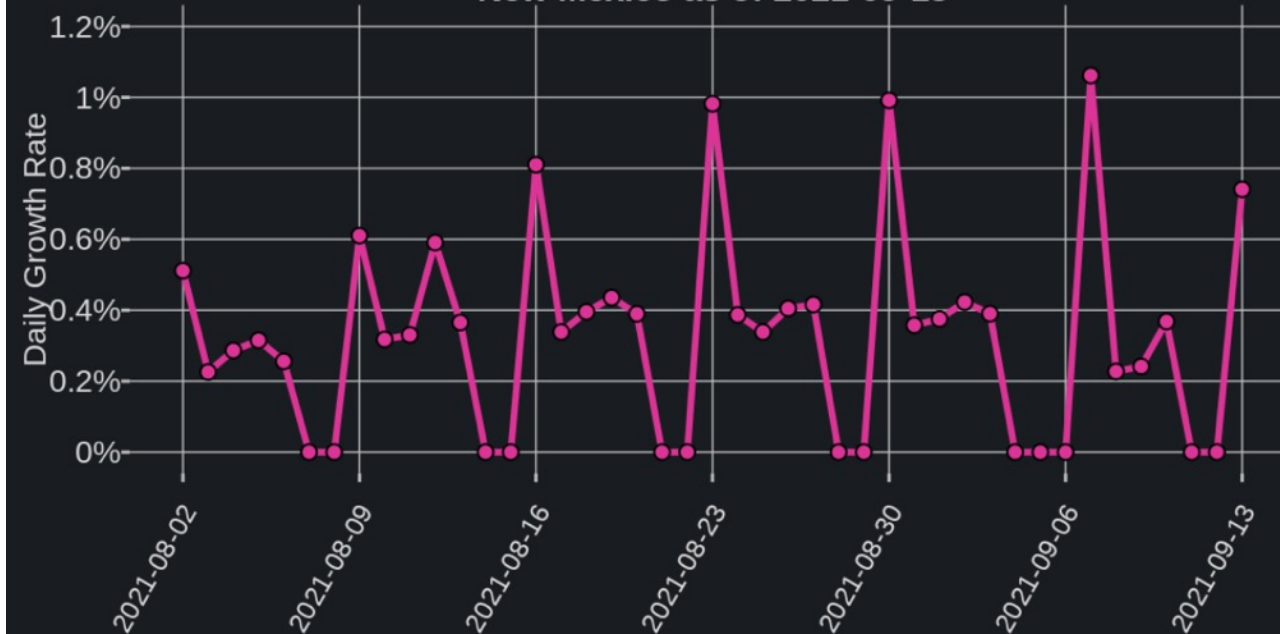
Week Start Date	Best Case (5th Percentile)	Middle Case (50th Percentile)	Worst Case (95th Percentile) [^]
2021-09-13		10*	
2021-09-20	1	5	13
2021-09-27	1	5	13
2021-10-04	1	6	13
2021-10-11	1	5	13
2021-10-18	1	5	13
2021-10-25	1	6	13

*Last reported confirmed deaths
[^]Closest-matching scenario

So what?
 Our model suggests that the number of daily deaths is expected to range between 1 and 13 in the next few weeks (worst case scenario)

Growth Rate for NM

Daily Growth Rate for the Past Six Weeks in New Mexico as of 2021-09-13



6-Week Forecast of the Average Weekly Growth Rate for New Mexico Based on Data as of 2021-09-13

Week	Best Case (5th Percentile)	Middle Case (50th Percentile)^	Worst Case (95th Percentile)
2021-09-13		0.38%*	
2021-09-20	0.040%	0.17%	0.45%
2021-09-27	0.034%	0.16%	0.42%
2021-10-04	0.031%	0.16%	0.40%
2021-10-11	0.032%	0.16%	0.40%
2021-10-18	0.030%	0.16%	0.41%
2021-10-25	0.027%	0.16%	0.42%

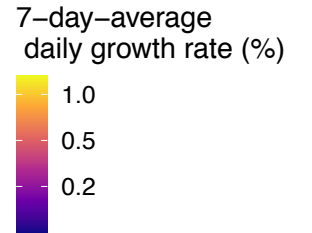
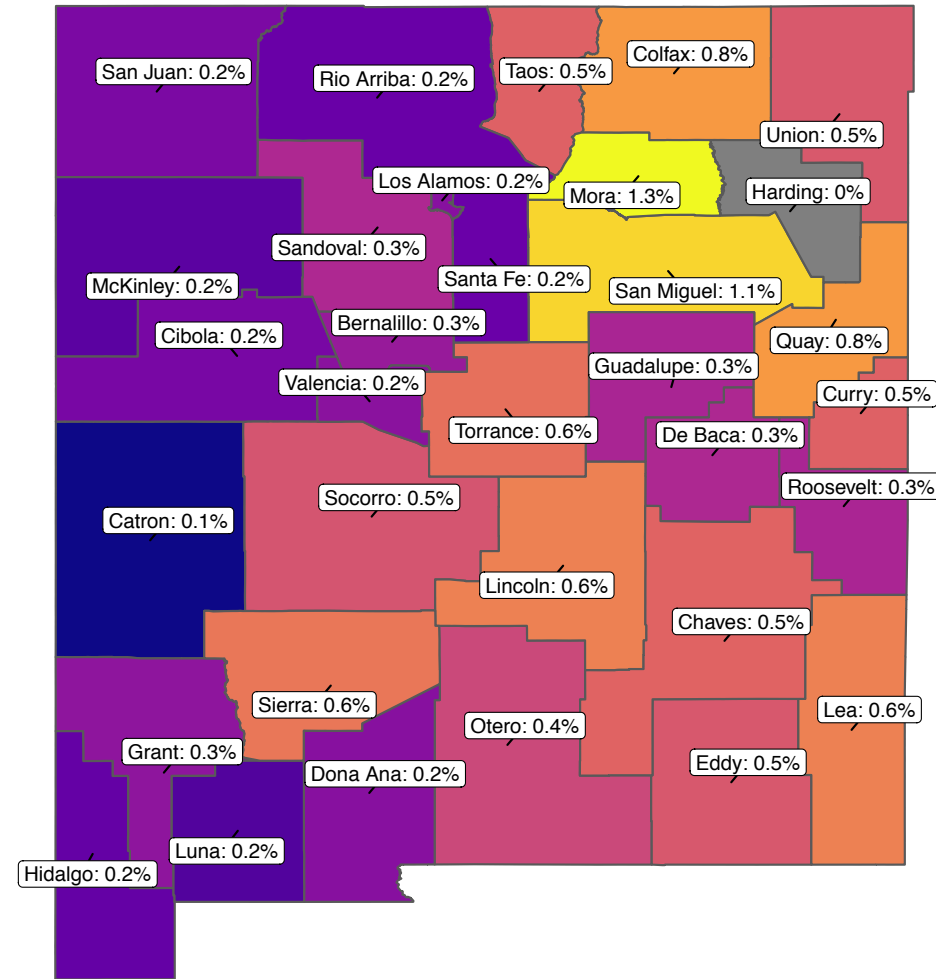
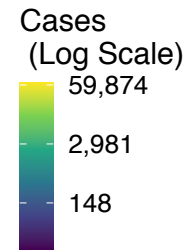
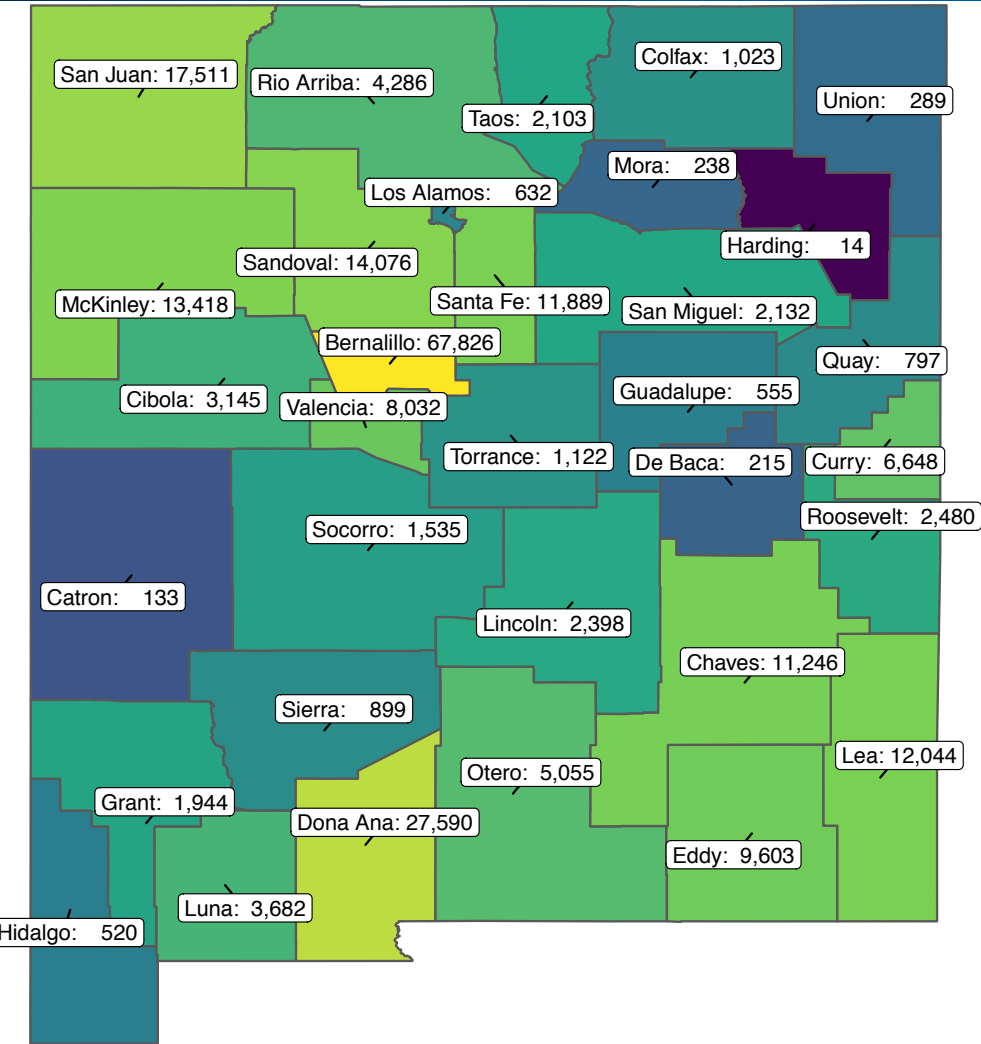
*Last weekly mean daily growth rate

^Closest-matching scenario

So what?

As of September 13th, the average growth rate in NM is at 0.38% (up from 0.22%)

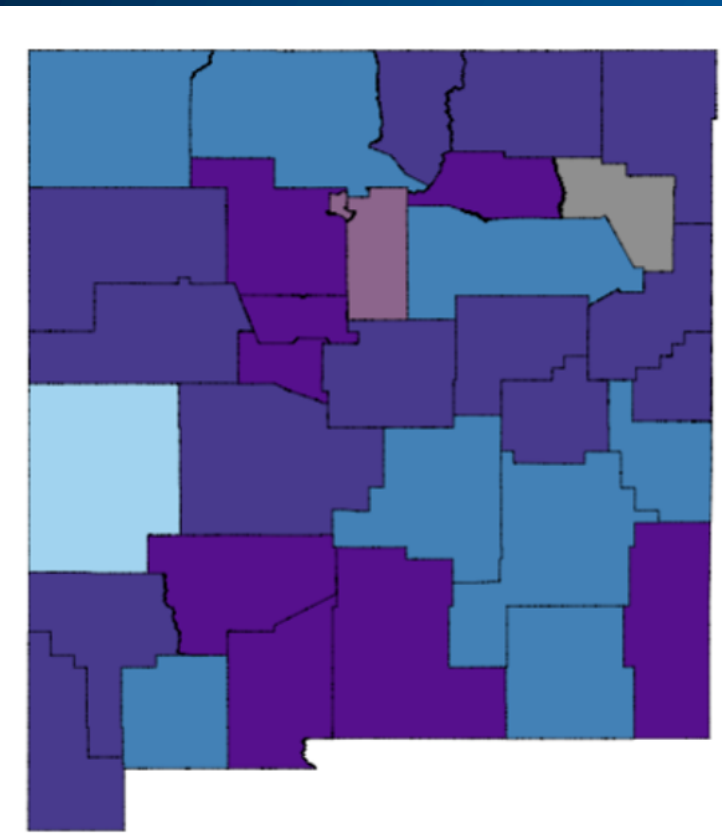
Cumulative Cases & Daily Growth Rate for NM: Sept 13



Cumulative growth rates are rising in middle NM

*Growth rate is in cumulative cases

Weekly Growth Rate for NM: Another View (Sept 13)



Impacted New Mexicans

Counties with New Cases This Week

Growth Rate	Accelerating	0k	0k	1.26M
	Constant	0k	167k	279k
	Decelerating	0k	4k	381k
		Low	Med	High
		Cases Per Capita		

Counties With No New Cases In ...

0k	0.5k	0k
Last Week	Two Weeks	3+ Weeks

So what?

- Most people in New Mexico are living in a county that is **high per-capita case counts with mixed accelerating & decelerating**
- Bernalillo and Dona Ana are slightly accelerating; warning for Mora, Sierra, Sandoval

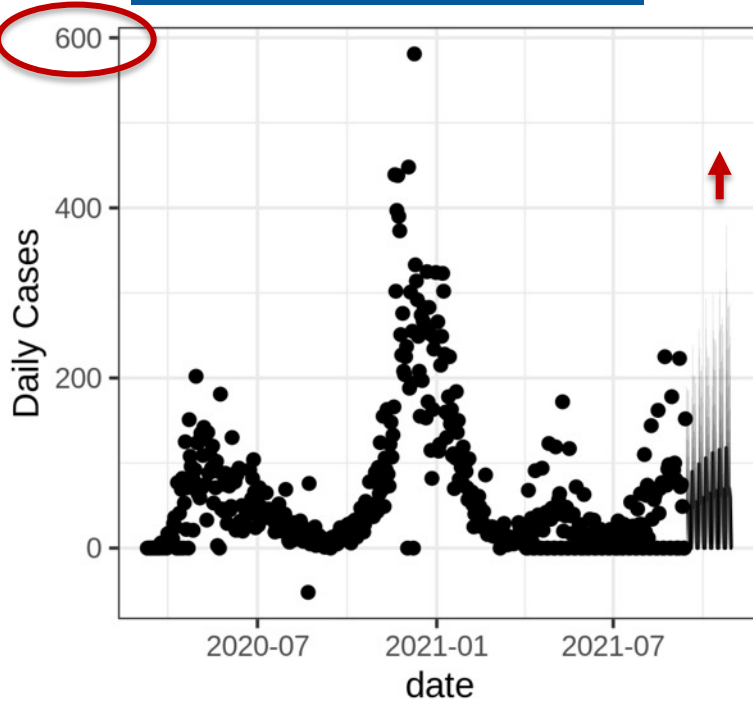
Number of New Mexicans living in regions with particular combinations of per capita case counts and 7-day growth rates

Low <10 cases/100k per week
 Med 10-99 cases/100k per week
 High >100 cases/100k per week

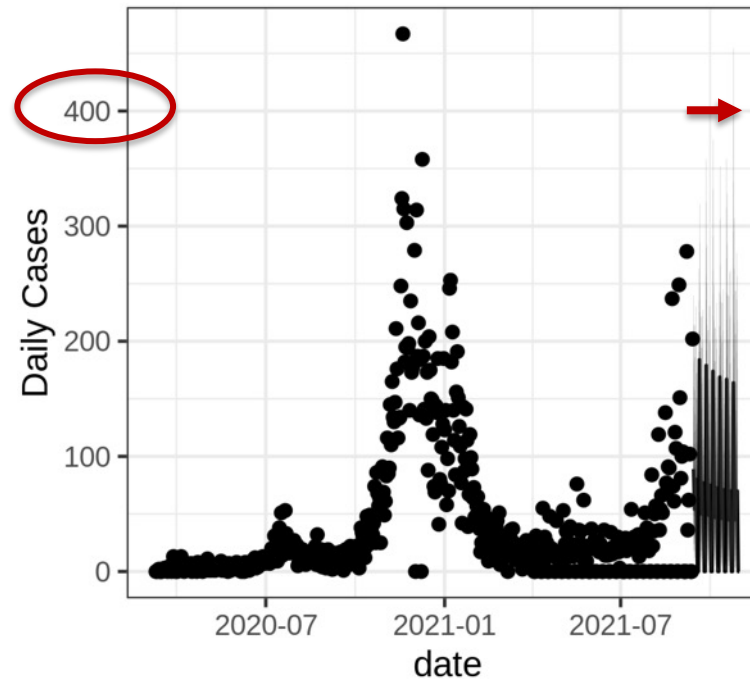
> **Additional Regional Forecasts**

Central & North Regions Daily Cases Forecast

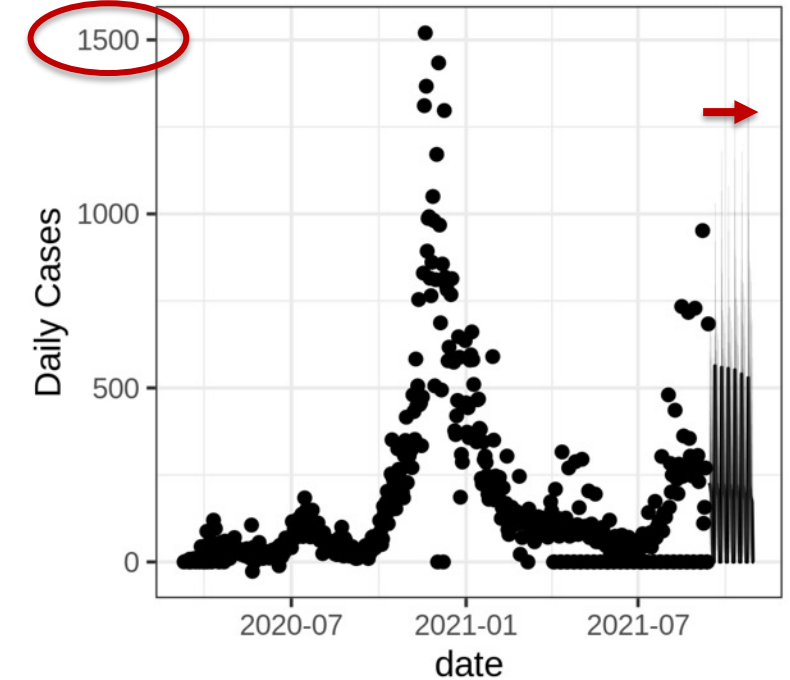
Northwest



Northeast



Central

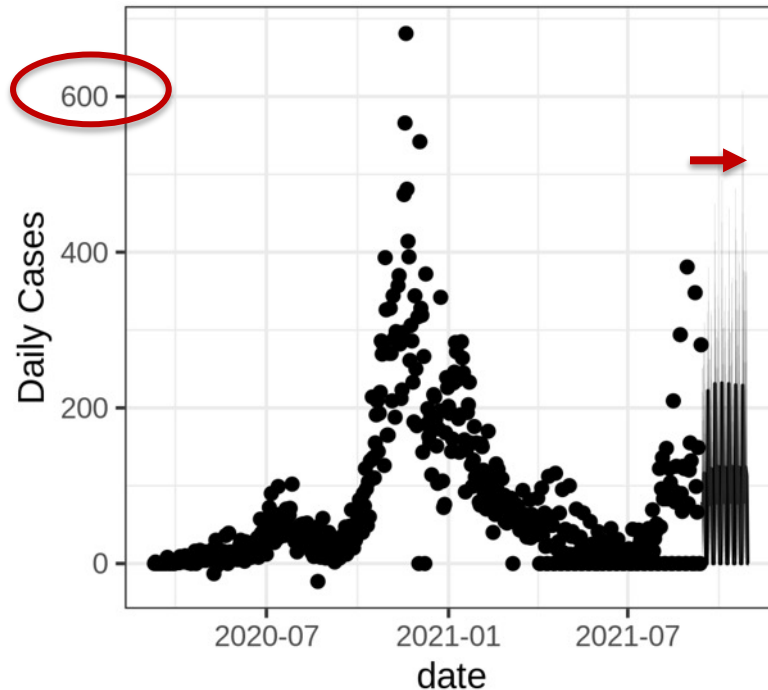


So what?

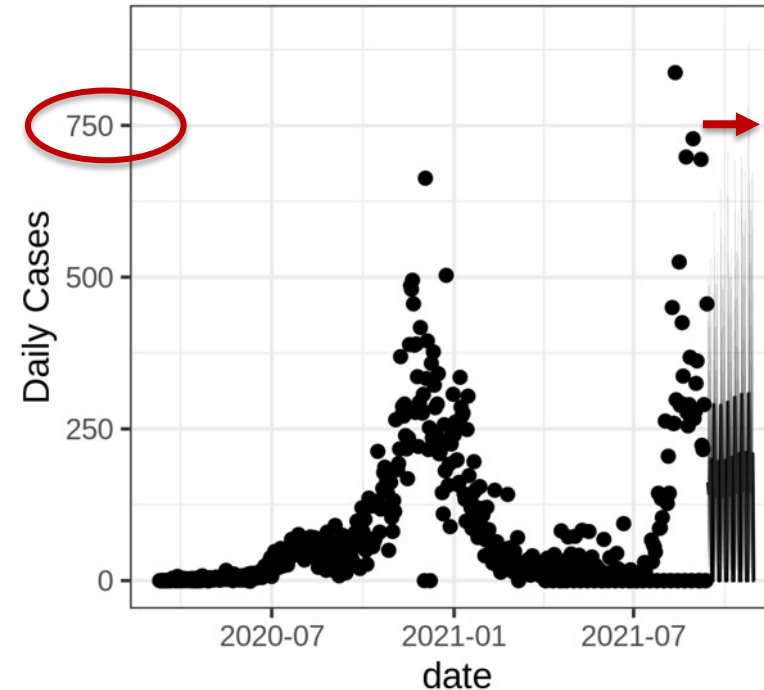
The number of daily cases across most regions appear to plateau but the northeast may see a slight increase

South Regions Daily Cases Forecast

Southwest



Southeast

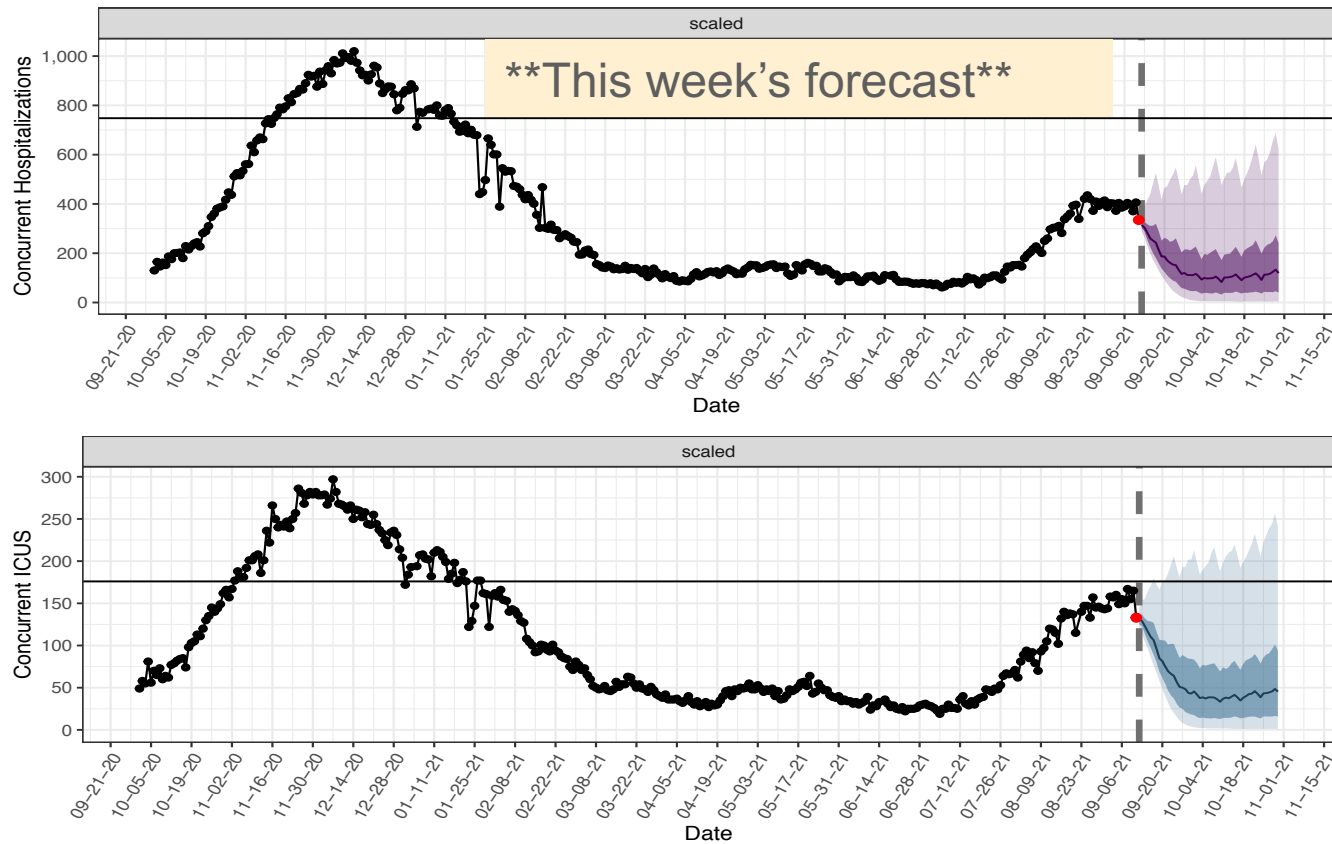


So what?

The number of daily cases across most regions appear to plateau but the southeast may see a slight increase

> Hospitalization Forecast

Concurrent Hosp & ICU Beds Based on Forecasts – Average Stay of 8 Hosp, 15 Days for ICU/vent & 25% ICU rate



Concurrent COVID-19 ICU beds

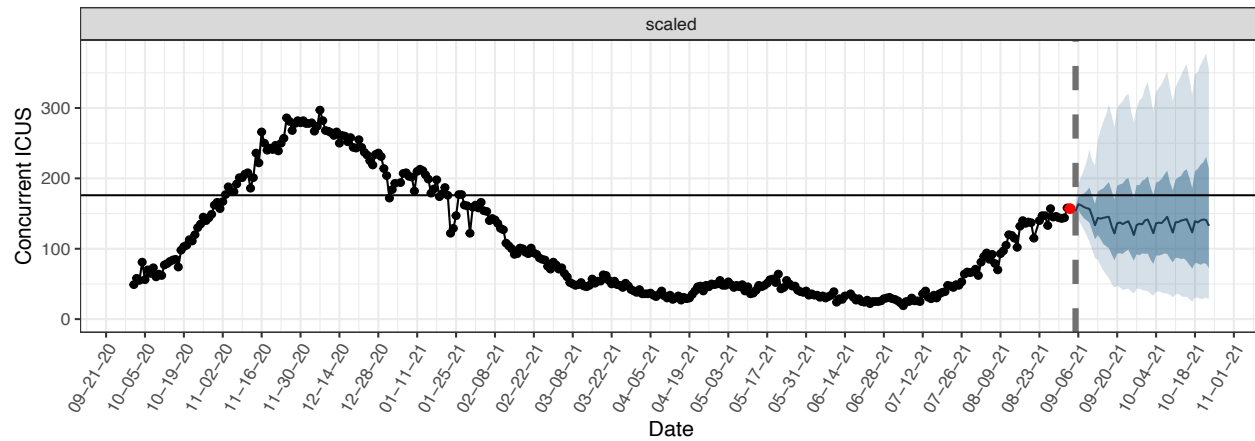
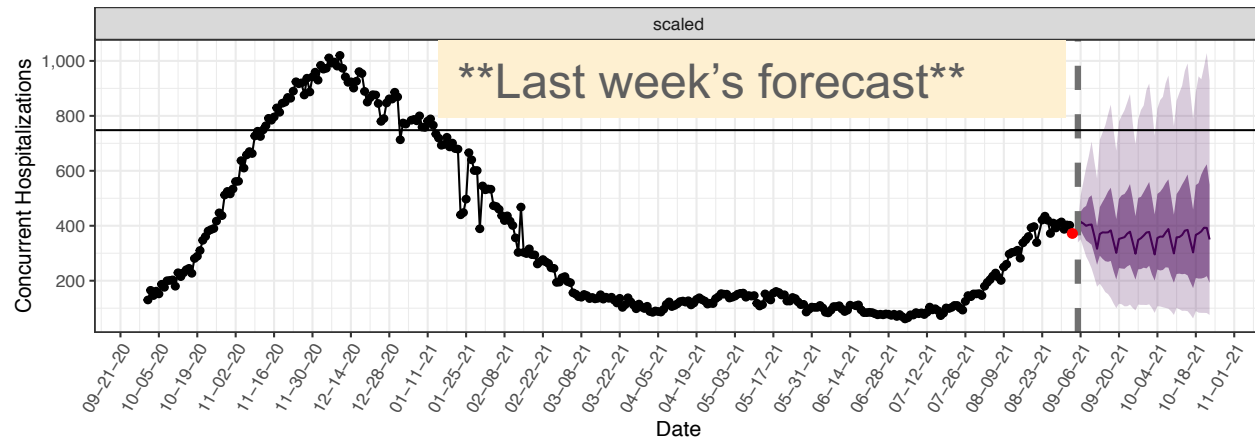
Week	Qu. 5% (best case)	Qu. 50% (median)	Qu. 95% (worst case)
9/19	58	85	166
9/26	11	51	181
10/3	2	38	184
10/10	2	33	188
10/17	1	35	192
10/24	1	39	206

“Scaled” Scenario

So what?

Interpret with caution, the model is potentially having trouble interpreting “outliers” from Labor Day reporting. Assume actual between median and worst case scenario.

Concurrent Hosp & ICU Beds Based on Forecasts – Average Stay of 8 Hosp, 15 Days for ICU/vent & 25% ICU rate



Concurrent COVID-19 non-ICU “med-surge” beds

Week	Qu. 5% (best case)	Qu. 50% (median)	Qu. 95% (worst case)
9/19	50	102	253
9/26	11	65	259
10/3	3	55	258
10/10	2	50	289
10/17	2	56	274
10/24	3	53	310

“Scaled” Scenario

So what?

Interpret with caution, the model is potentially having trouble interpreting “outliers” from Labor Day reporting. Assume actual between median and worst case scenario.