Modeling & Forecasting COVID-19 in NM

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September 21, 2021

NNSA
National Nuclear Security Administration

Short- & Long-Term Forecast for NM: Cases

Cumulative Cases

7-day Cumulative Confirmed Cases Forecast for New Mexico Based on Data as of 2021-09-20

Prediction Intervals: 10%, 20%, 30%, 40%, 50%, 60%, 70%, 80%, 90%

6–Week Forecast of Confirmed Cases for New Mexico Based on Data as of 2021–09–20

Week	Best Case (5th Percentile)	Middle Case (50th Percentile)^	Worst Case (95th Percentile)
2021–09–20		246,229*	
2021–09–27	247,092	249,351	254,203
2021–10–04	247,899	252,422	262,049
2021–10–11	248,667	255,442	269,944
2021–10–18	249,344	258,412	278,102
2021–10–25	249,878	261,436	286,789
2021–11–01	250,395	264,444	295,975

*Last reported confirmed cases count
^Closest–matching scenario

Daily Average

6–Week Forecast of Daily Average of Confirmed Cases for New Mexico Based on Data as of 2021–09–20

Week End Date	Best Case (5th Percentile)	Middle Case (50th Percentile)^	Worst Case (95th Percentile)
2021–09–20		652*	
2021–09–27	124	448	1,144
2021–10–04	111	434	1,130
2021–10–11	100	426	1,149
2021–10–18	87	425	1,192
2021–10–25	76	425	1,251
2021–11–01	66	422	1,330

*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

7-day Deaths Forecast for New Mexico Based on Data as of 2021-09-20

Prediction Intervals: 10%, 20%, 30%, 40%, 50%, 60%, 70%, 80%, 90%

6–Week Forecast of Deaths for New Mexico Based on Data as of 2021–09–20

Week	Best Case (5th Percentile)	Middle Case (50th Percentile)	Worst Case (95th Percentile)^
2021–09–20		4,689*	
2021–09–27	4,718	4,764	4,805
2021–10–04	4,745	4,843	4,939
2021–10–11	4,770	4,927	5,100
2021–10–18	4,794	5,016	5,298
2021–10–25	4,816	5,108	5,541
2021–11–01	4,837	5,202	5,829

*Last reported deaths count
^Closest–matching scenario

Daily Average

6–Week Forecast of Daily Average of Deaths for New Mexico Based on Data as of 2021–09–20

Week Start Date	Best Case (5th Percentile)	Middle Case (50th Percentile)	Worst Case (95th Percentile)^
2021–09–20		10*	
2021–09–27	4	10	19
2021–10–04	3	10	22
2021–10–11	3	11	26
2021–10–18	3	12	31
2021–10–25	3	12	37
2021–11–01	2	13	45

*Last reported confirmed deaths
^Closest–matching scenario

So what?

Our model suggests that the number of daily deaths is expected to be around 10 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 2021-09-20
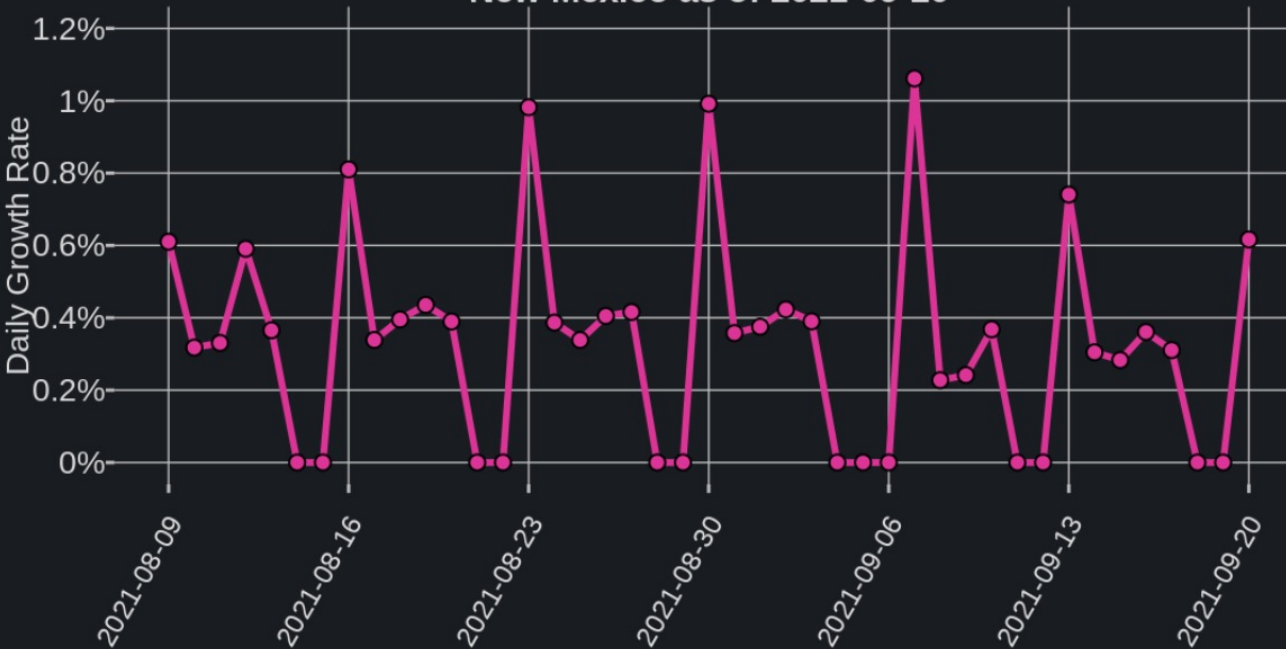
6-Week Forecast of the Average Weekly Growth Rate for New Mexico Based on Data as of 2021-09-20

Week	Best Case (5th Percentile)	Middle Case (50th Percentile)^	Worst Case (95th Percentile)
2021-09-20		0.27%*	
2021-09-27	0.050%	0.18%	0.46%
2021-10-04	0.047%	0.18%	0.44%
2021-10-11	0.044%	0.17%	0.43%
2021-10-18	0.039%	0.17%	0.43%
2021-10-25	0.031%	0.17%	0.44%
2021-11-01	0.030%	0.16%	0.45%

*Last weekly mean daily growth rate
^Closest-matching scenario

So what?
As of September 20th, the average growth rate in NM is at 0.27% (down from 0.38%)

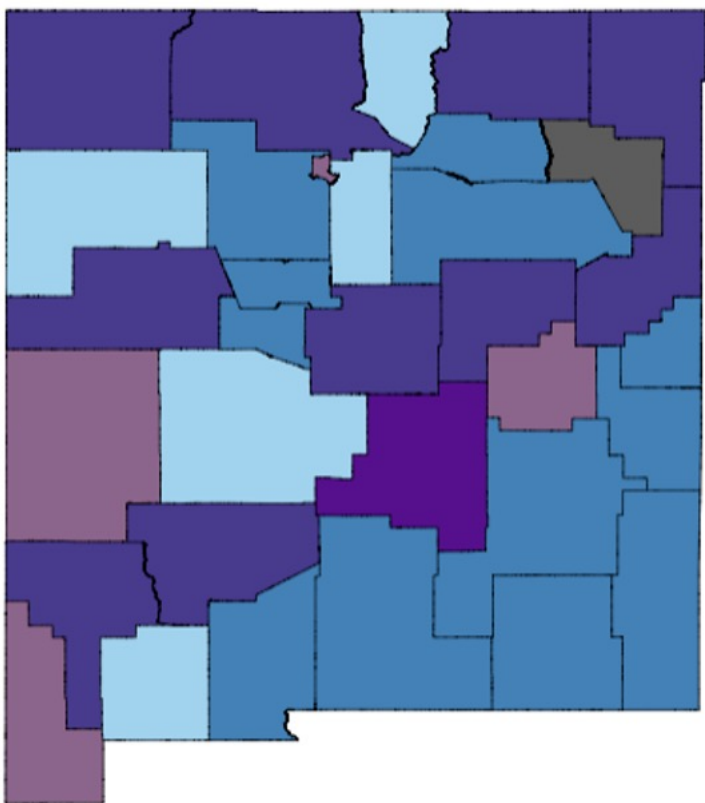# Cumulative Cases & Daily Growth Rate for NM: Sept 20
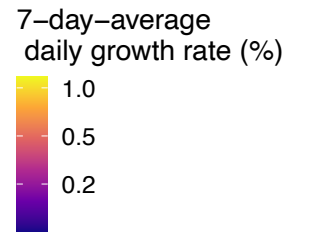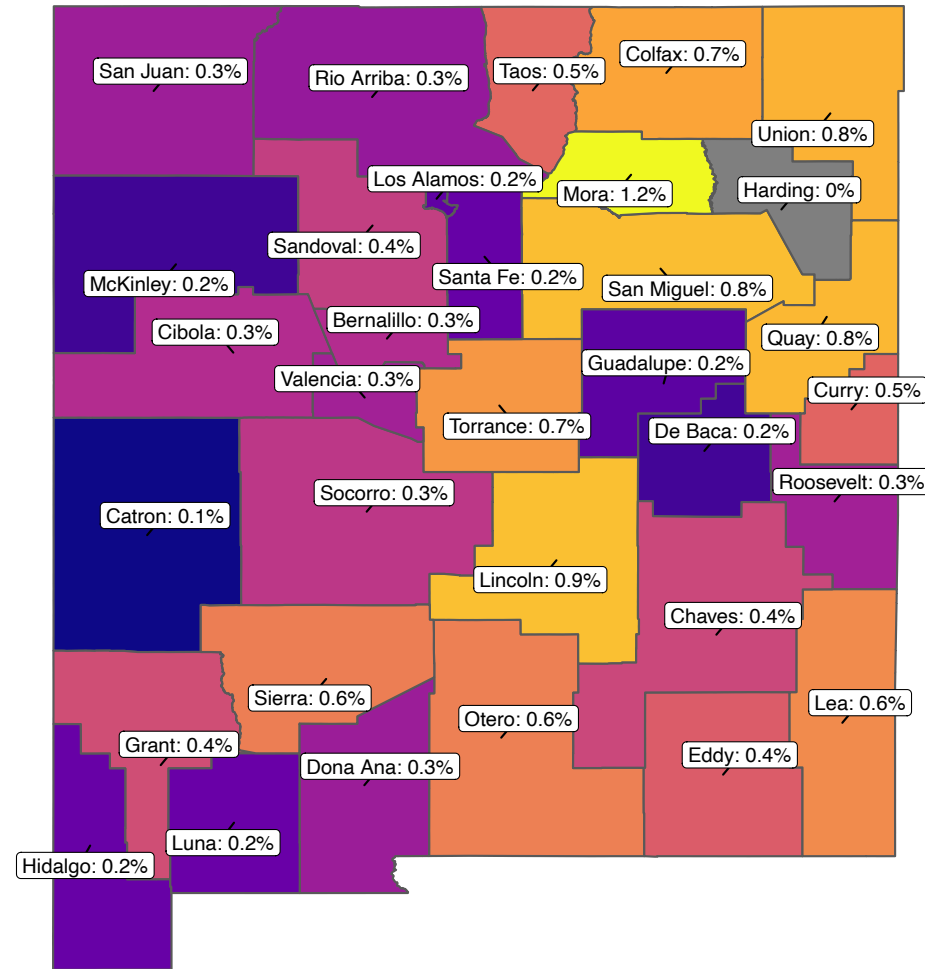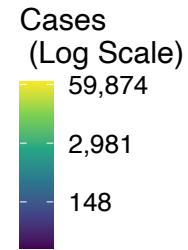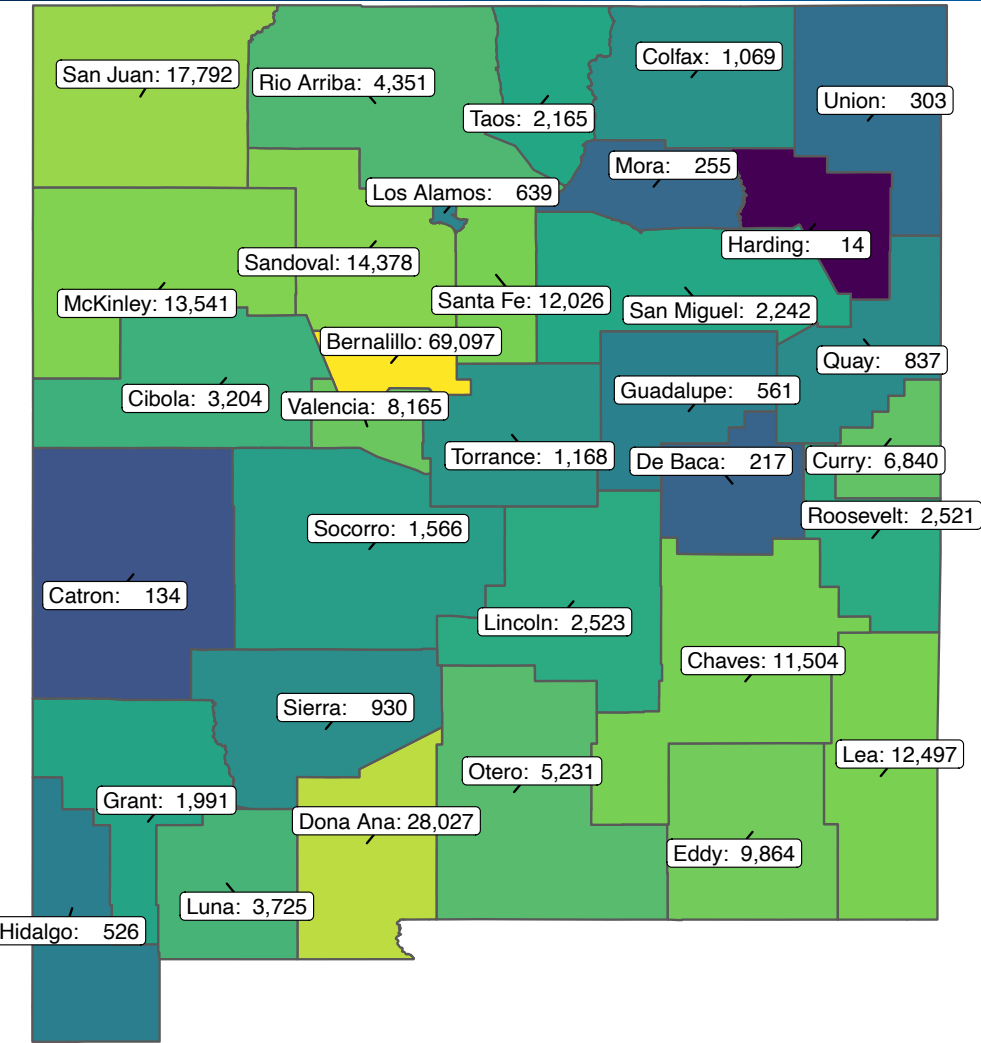
Cumulative growth rates are rising in middle NM

*Growth rate is in cumulative cases

Impacted New Mexicans

Counties with New Cases This Week

	Low	Med	High	
Growth Rate	0k	0k	19k	Accelerating
	0k	28k	278k	Constant
	0k	296k	1.47M	Decelerating

Cases Per Capita

Counties With No New Cases In ...

0k	0k	0.5k
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 decelerating**

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

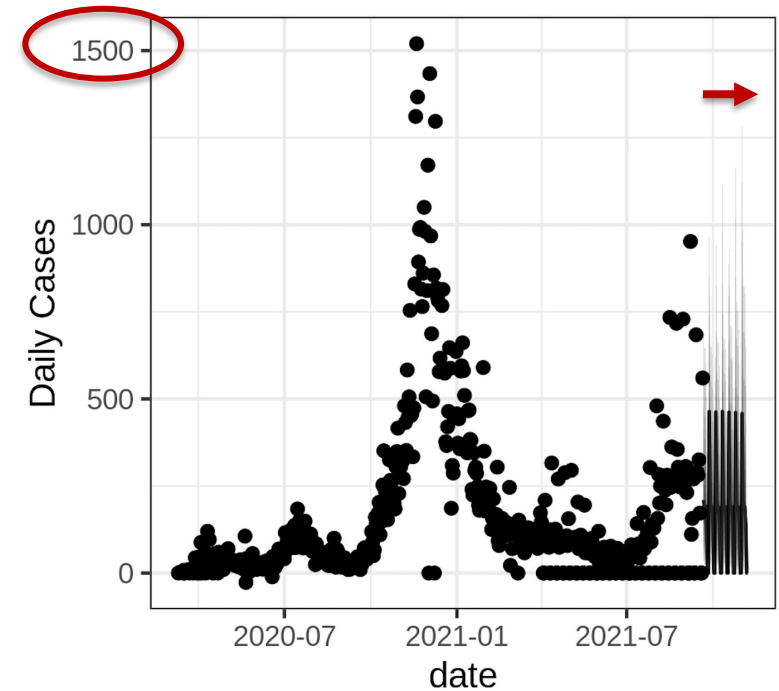# > Additional Regional Forecasts

Central & North Regions Daily Cases Forecast
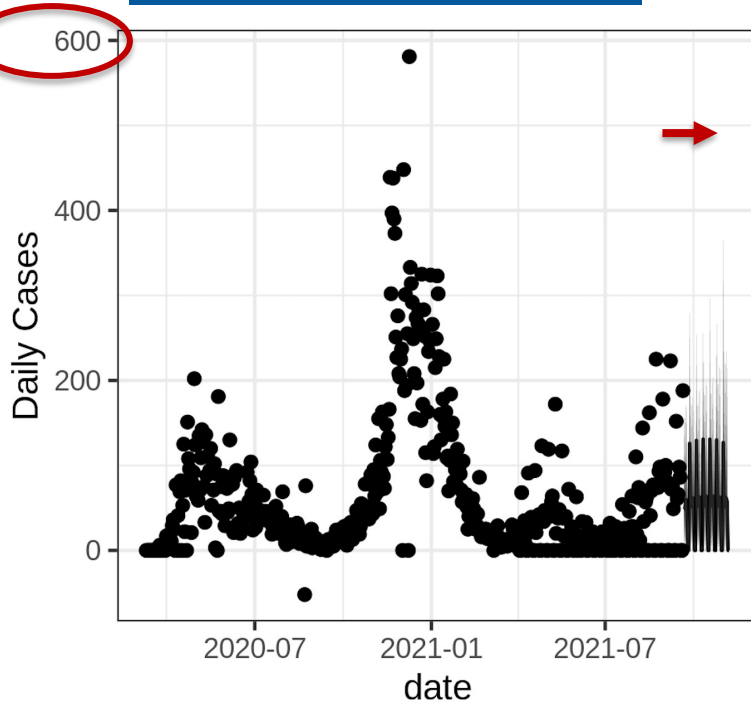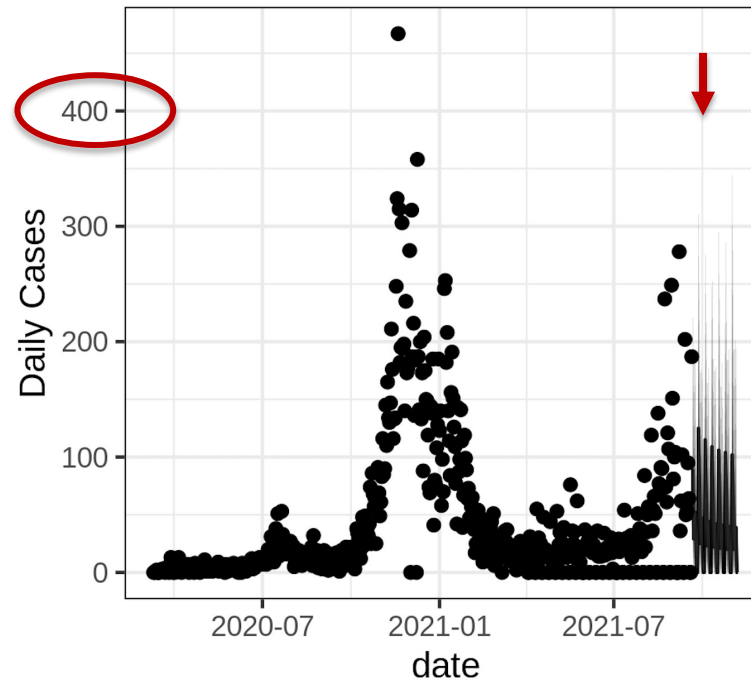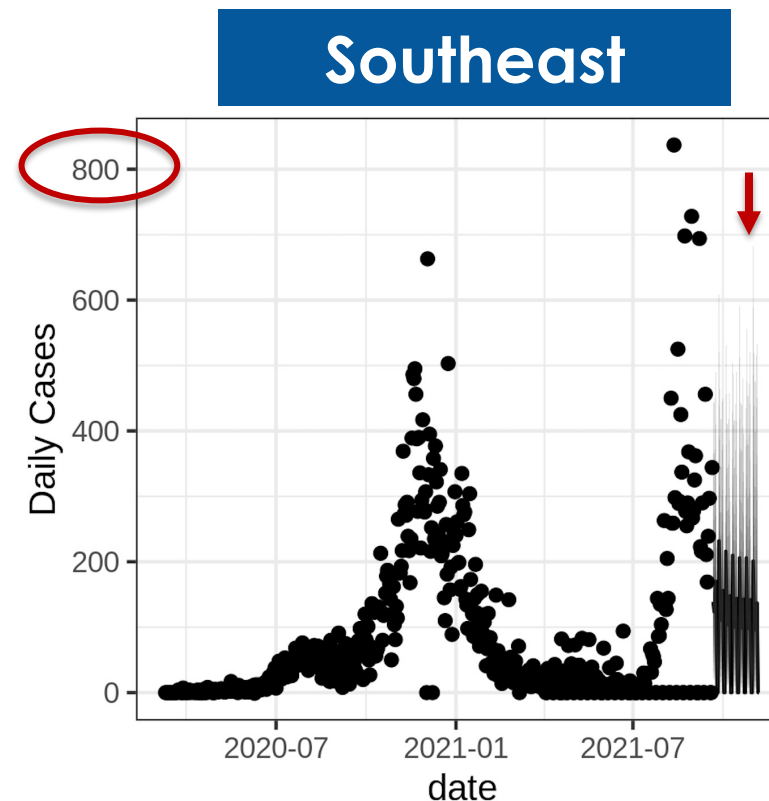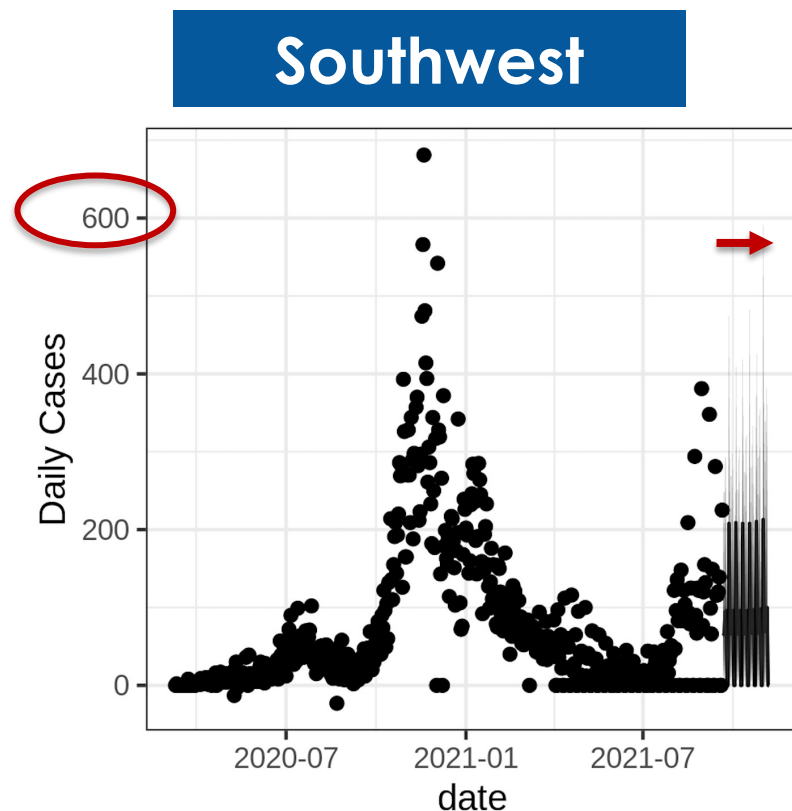

So what?

The number of daily cases across most regions appear to plateau but the northeast may see a slight decrease
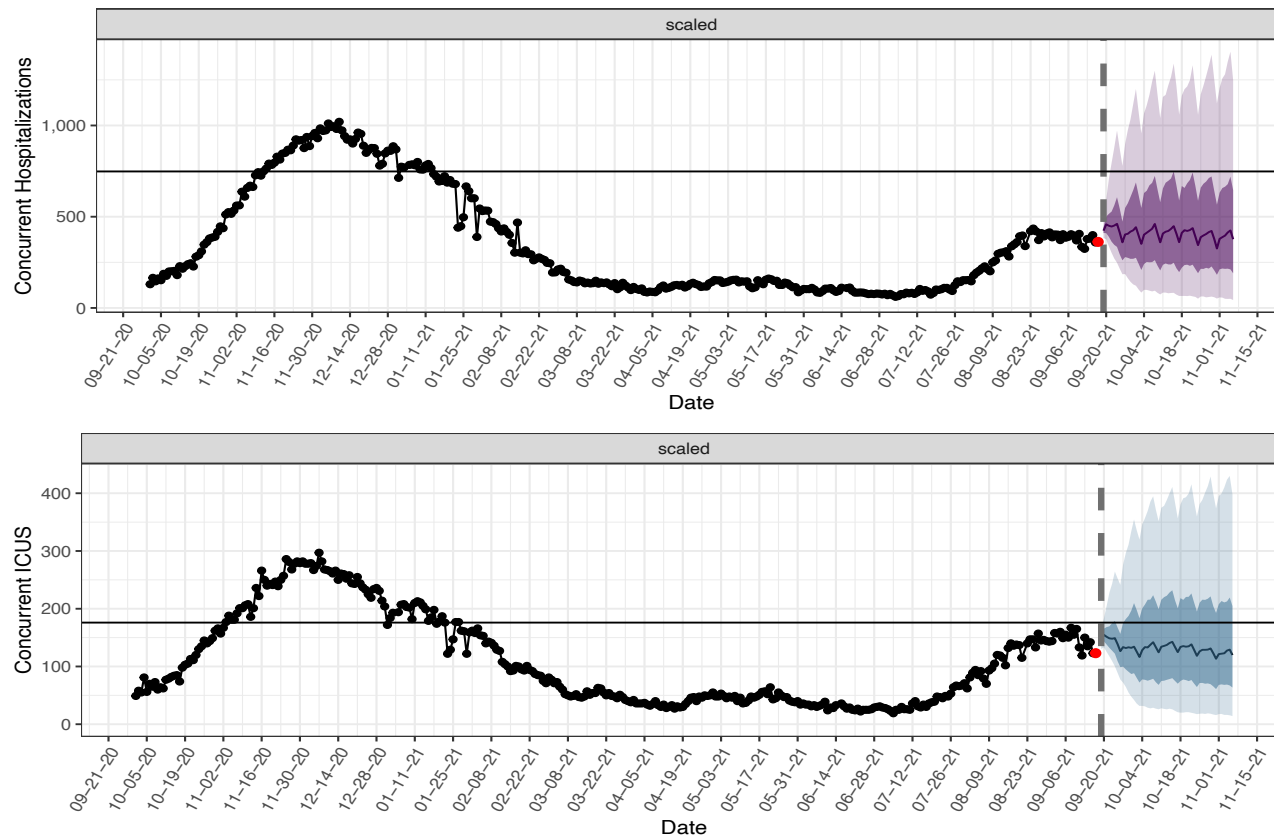
South Regions Daily Cases Forecast

Southwest

Southeast

So what?

The number of daily cases across the Southwest appear to plateau but the southeast may see a slight decrease

> Hospitalization Forecast

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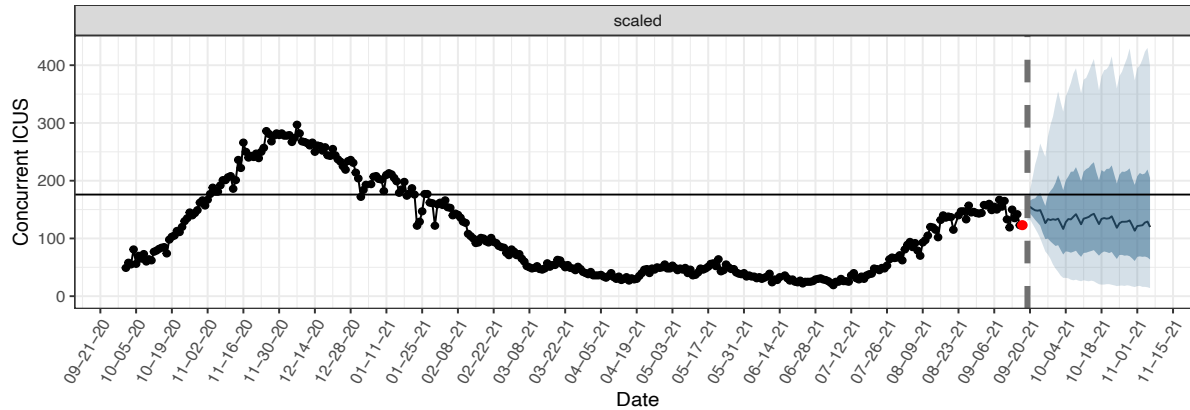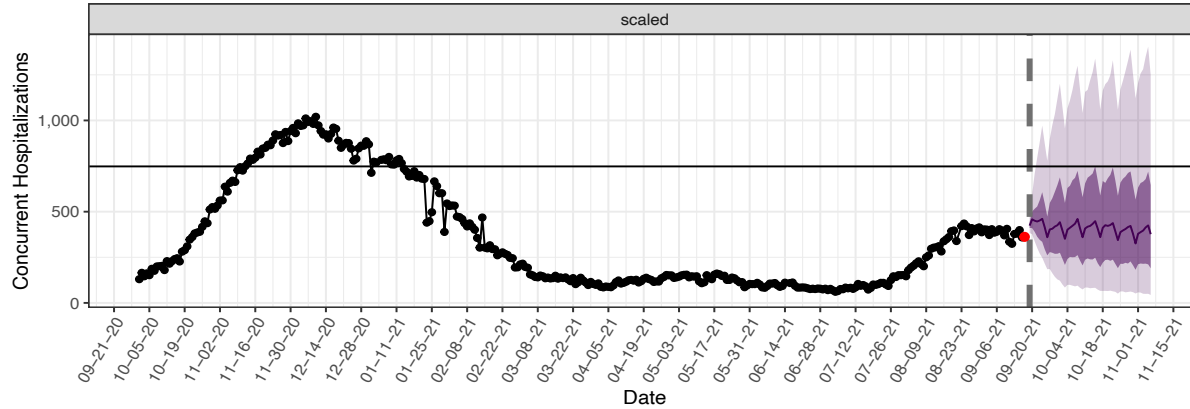

Concurrent COVID-19 ICU beds

Week	Qu. 5% (best case)	Qu. 50% (median)	Qu. 95% (worst case)
9/26	77	127	242
10/3	32	116	320
10/10	26	125	352
10/17	21	125	357
10/24	17	118	360
10/31	16	113	374

"Scaled" Scenario

t?

IC   the next three weeks. Model is calibrating so
a   his week.

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

Concurrent COVID-19 <u>non-ICU</u> "med-surge" beds

| Week	Qu. 5% (best case)	Qu. 50% (median)	Qu. 95% (worst case)
9/26	107	233	537
10/3	53	235	637
10/10	48	235	689
10/17	45	236	703
10/24	34	226	699
10/31	36	212	747

"Scaled" Scenario

So what?

Med-surge beds are expected to hold steady or decrease over the next three weeks.

21 Sept 2021: EpiGrid modeling

- NM daily incidence is declining. The decline is driven by mitigations: masking, vaccination, quarantine, isolation.
- Effectiveness of mitigations is likely recovering as incidence falls (i.e. tracing, followed by quarantine or isolation).
- Testing positivity rates are improving.
- NM daily deaths will likely peak in September. A long tail into October is likely.
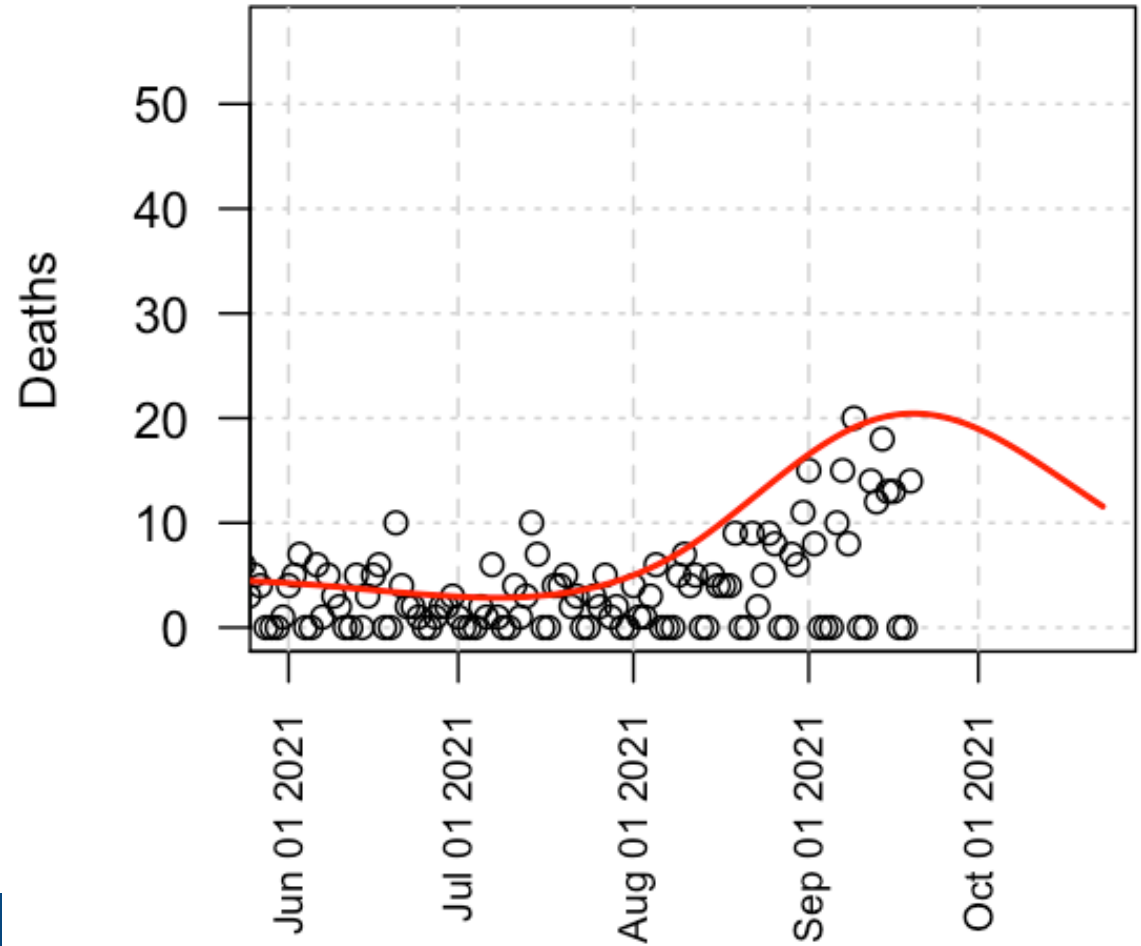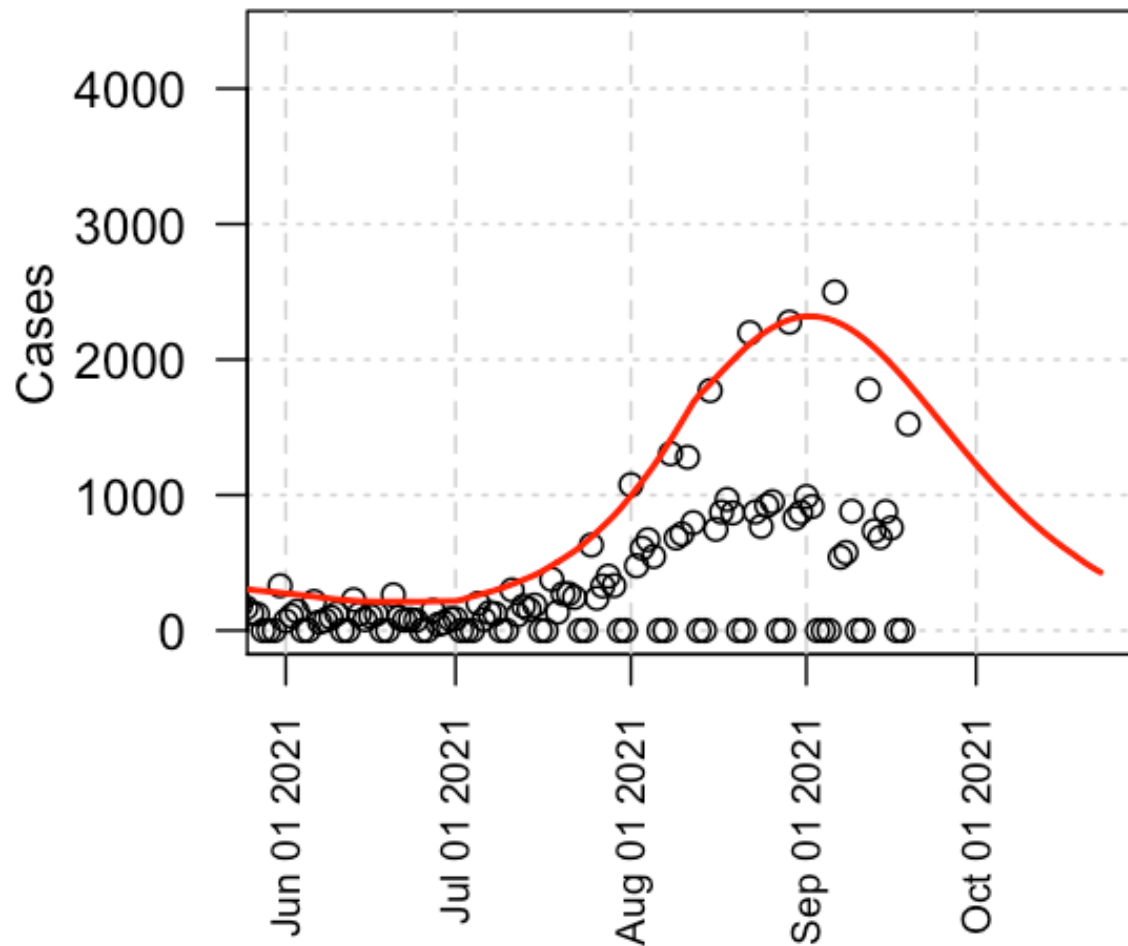
A look at the raw incidence data

- 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.
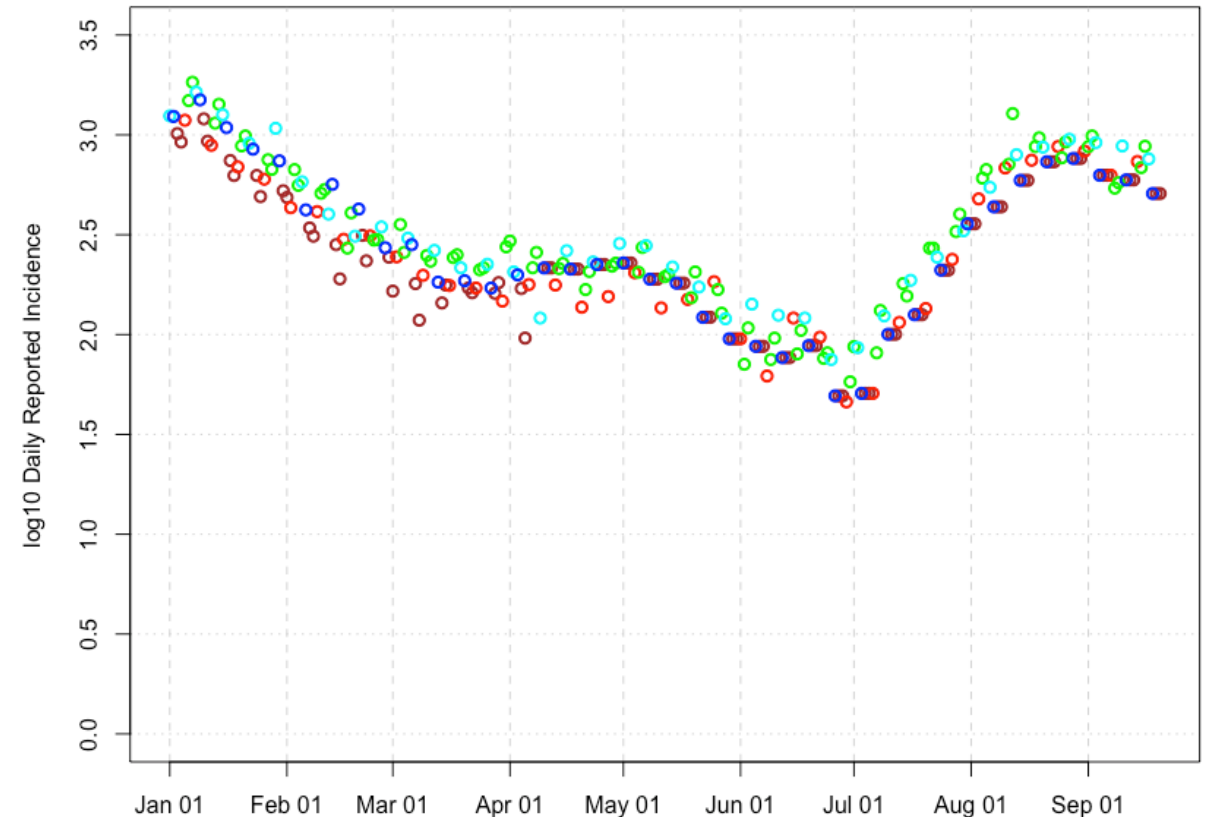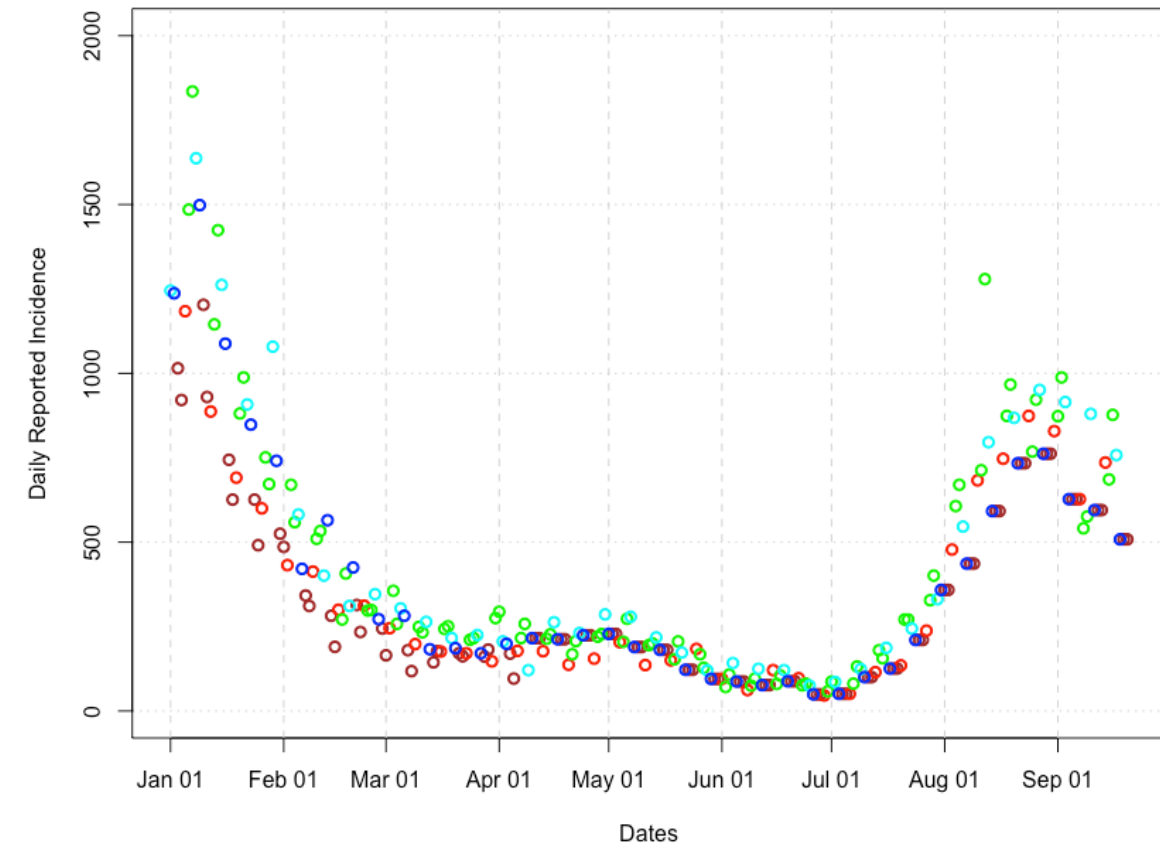
21 September 2021 Vaccine Analysis and Summary

- **~1397k first doses have been administered in NM.**
- **~1225k completed vaccine series in NM.**
- **Epigrid is modeling this as 1397k first doses.**
- **~66.6% of all persons in New Mexico are at least minimally vaccinated.**

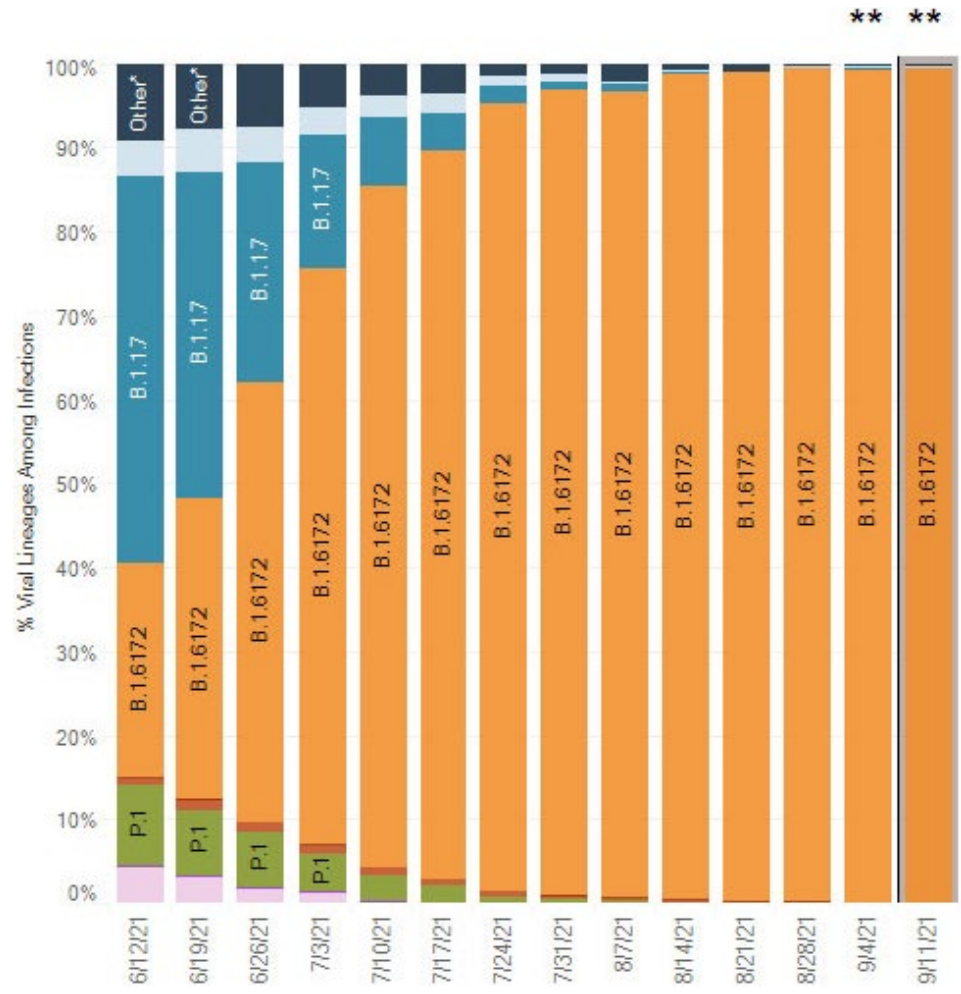- **Federal vaccine orders will likely drive more rapid adoption in the near future.**

Black – vaccination for all New Mexicans

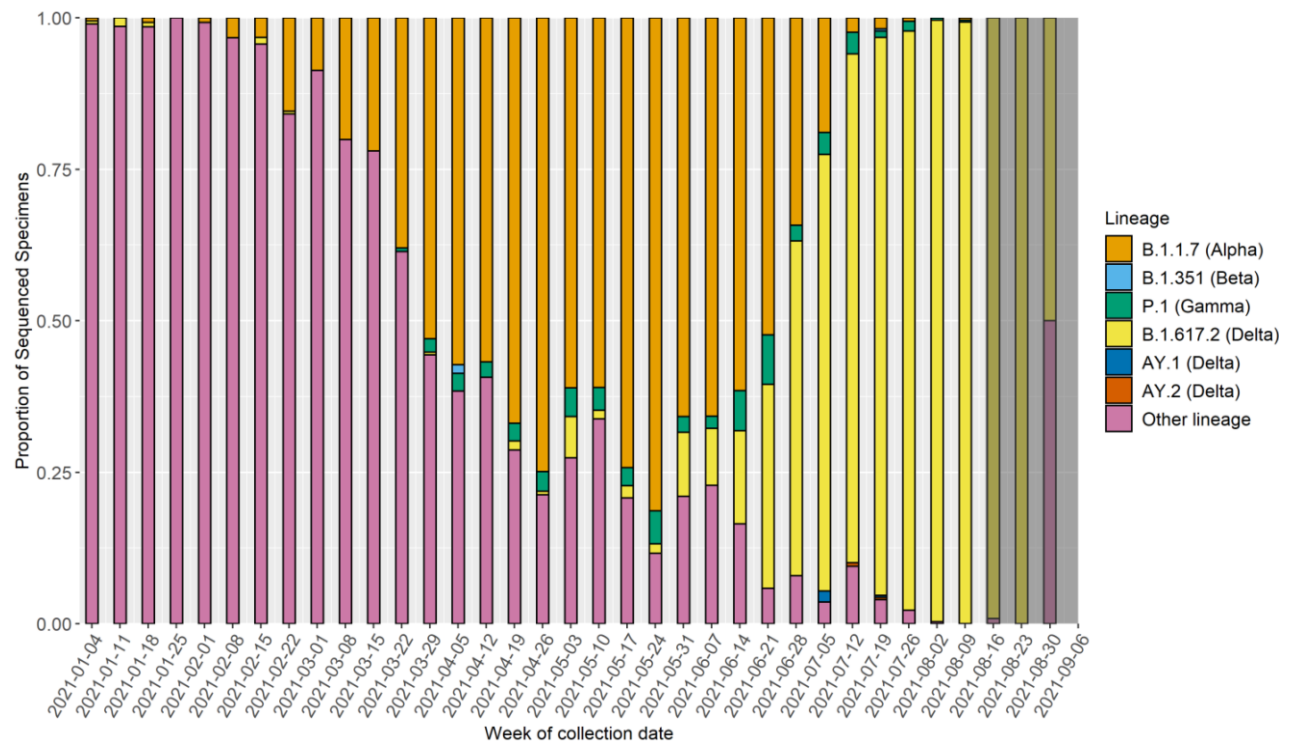Red – First dose data used in EpiGrid.
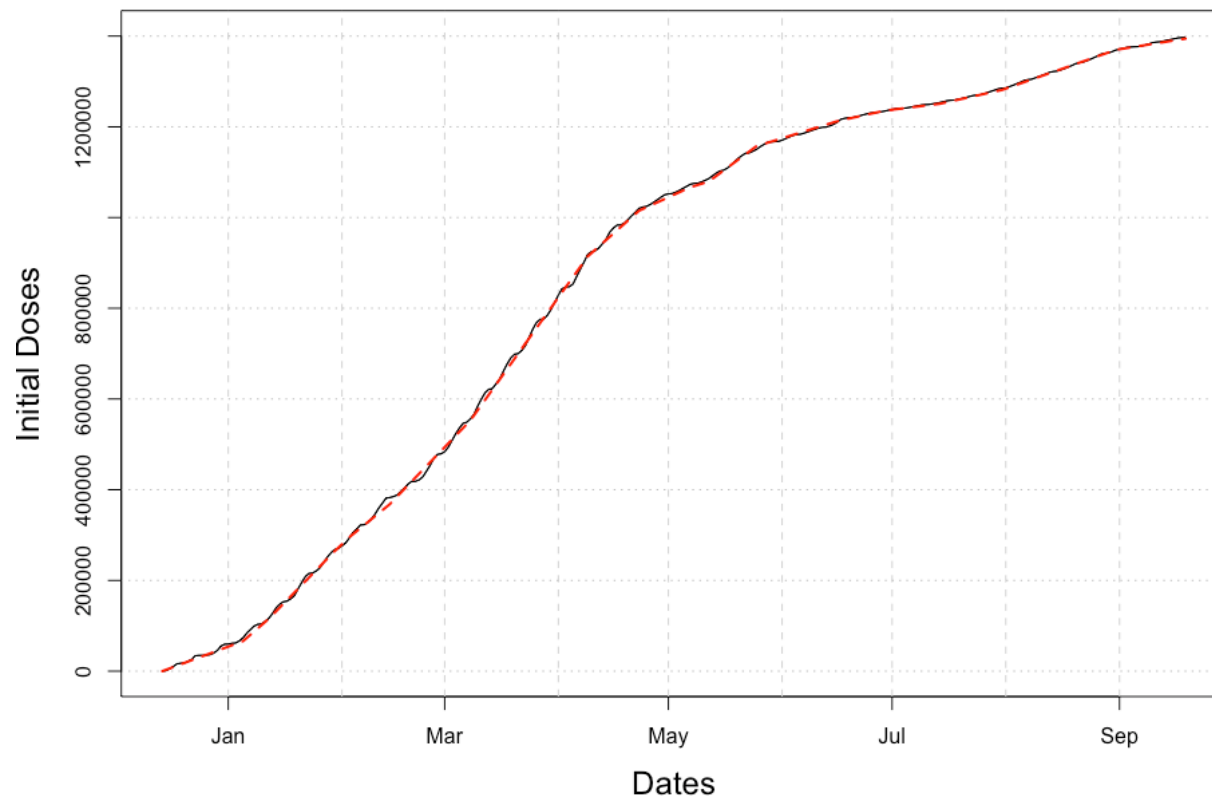
Variants: Still Delta (for now, keep watching …)

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

https://www.cdc.gov/coronavirus/2019-ncov/covid-data/covidview/09172021/images/variants1_09172021.jpg?_=21371?noicon

B.1.617.2, "Δ" is "Indian variant"
B.1.1.7, "α" is "UK variant"
P.1 is "Brazil variant"
Other variants are being reported in multiple countries.

New Mexico data likely still showing Delta dominant

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: Michigan, New York, N. Carolina, Texas. Modest Declines: Illinois. Declining: California, Florida (from a high baseline), Georgia, New Mexico.

|	Cases	Deaths
New York	25.01	0.169
Michigan	30.46	0.25
Ohio	59.28	0.387
Florida	49.99	1.607
New Mexico	32.81	0.475
Illinois	29.53	0.375
Texas	53.77	0.963
California	25.62	0.318
North Carolina	68.22	0.726
Georgia	52.9	1.054
Pennsylvania	36.17	0.311

Daily rates per 100,000 residents averaged September 6th thru September 20th 2021.
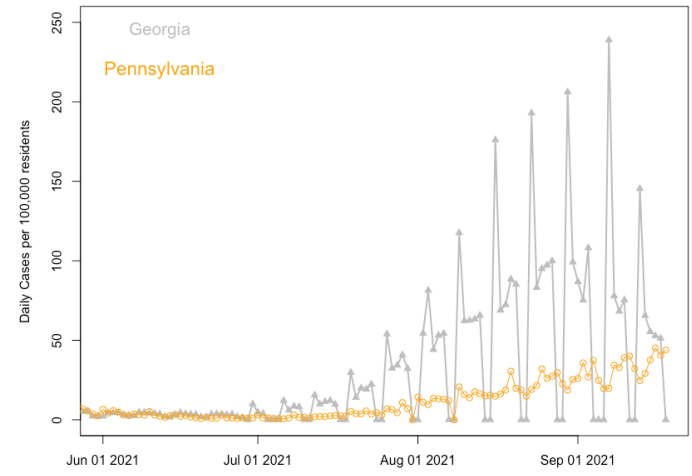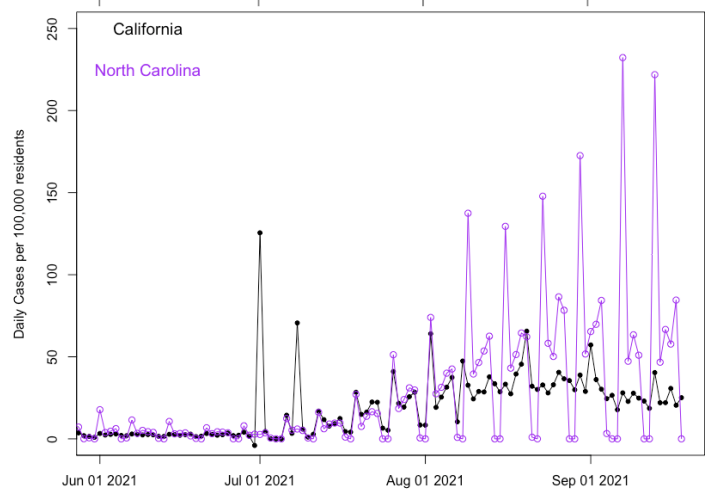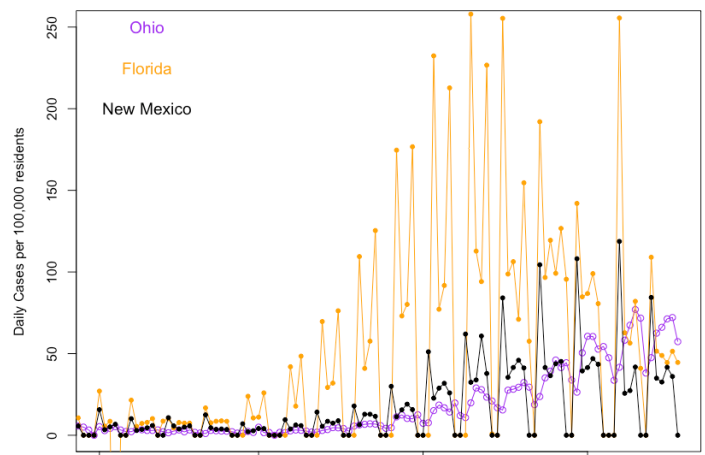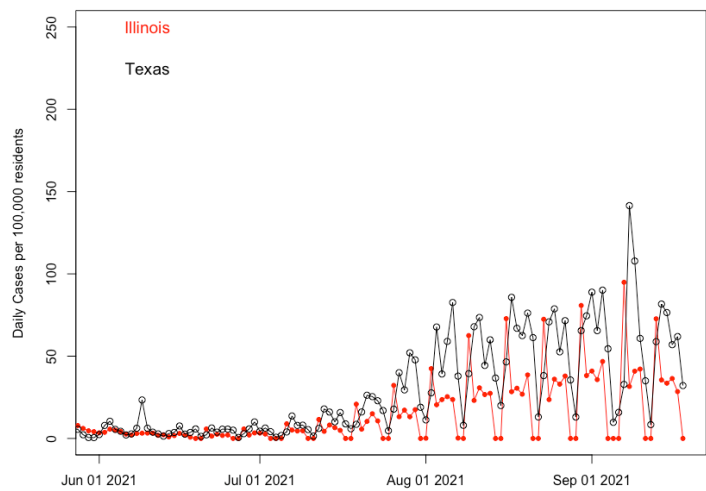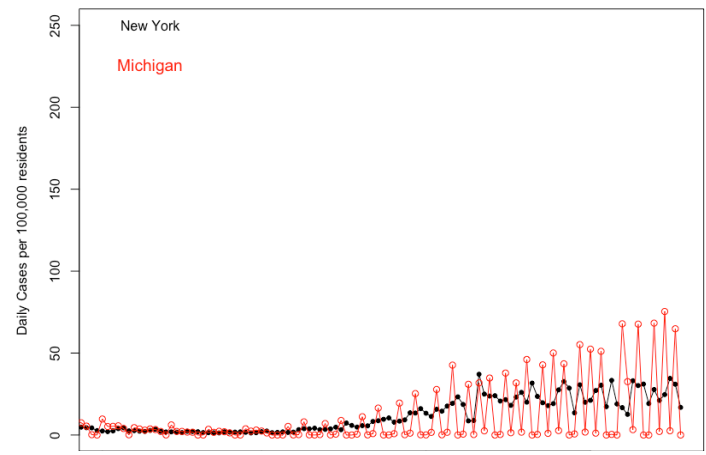
Regional roll-overs have happened. Other areas are still rising.

Cases plotted versus vaccination by county

Percent of entire population that is fully vaccinated
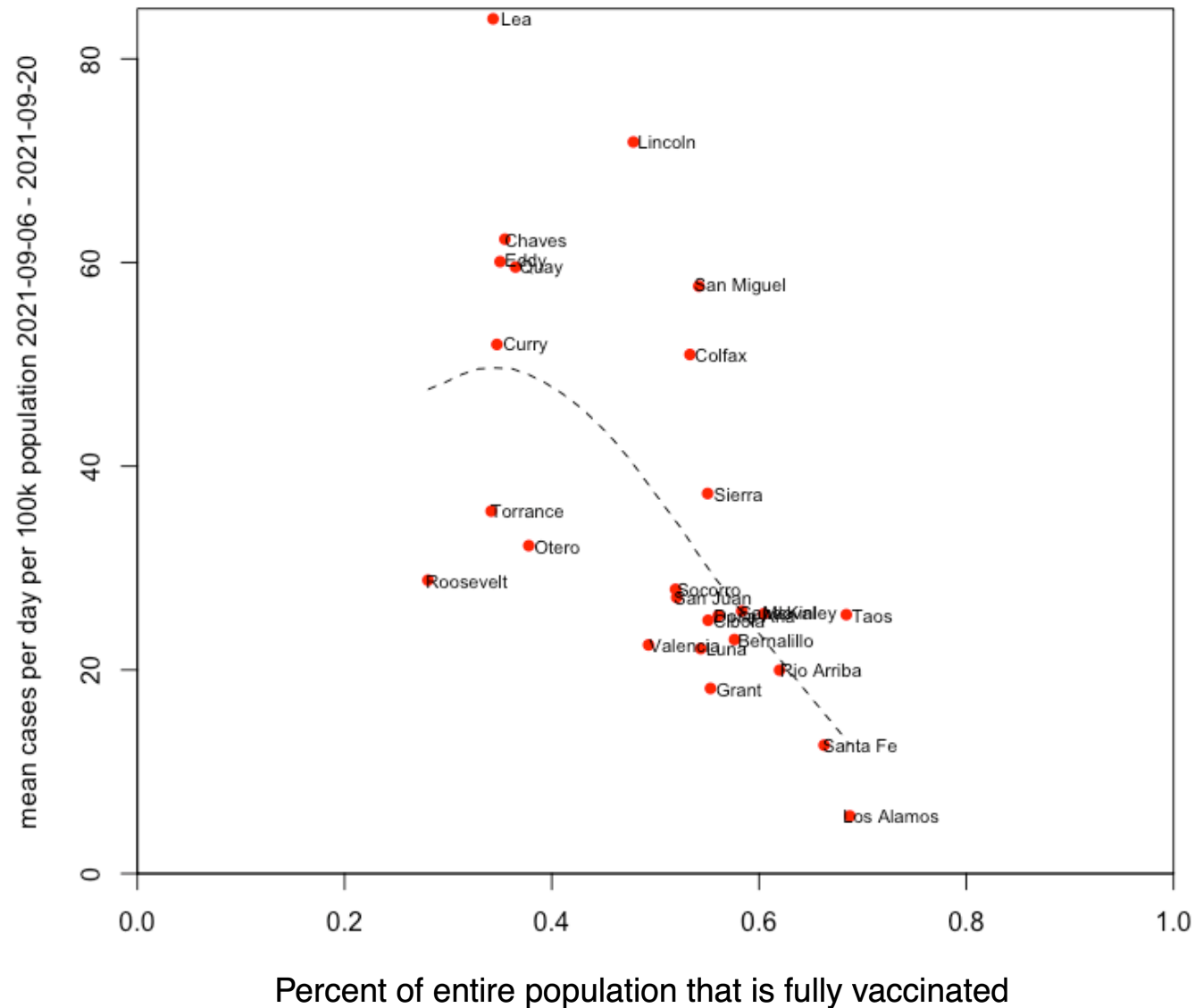
The relationship between vaccination and cases is strong and **highly** protective on a by-county basis.

Infection control relative to vaccination rates.
- Lea County has not improved in the last week. Lincoln County has risen.
- San Miguel County moved downward, but is still high.
- Colfax, Eddy, Chaves, Quay Counties are marginally high.
- Grant, Los Alamos, Otero, Roosevelt, Torrance, Valencia 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.

- Most Counties continue to have high absolute transmission.
- Further improvement is crucial to minimizing the pandemic's burden.
- Improvement in one geographical regions benefits all counties because travel drives epidemic spread from areas of high incidence.
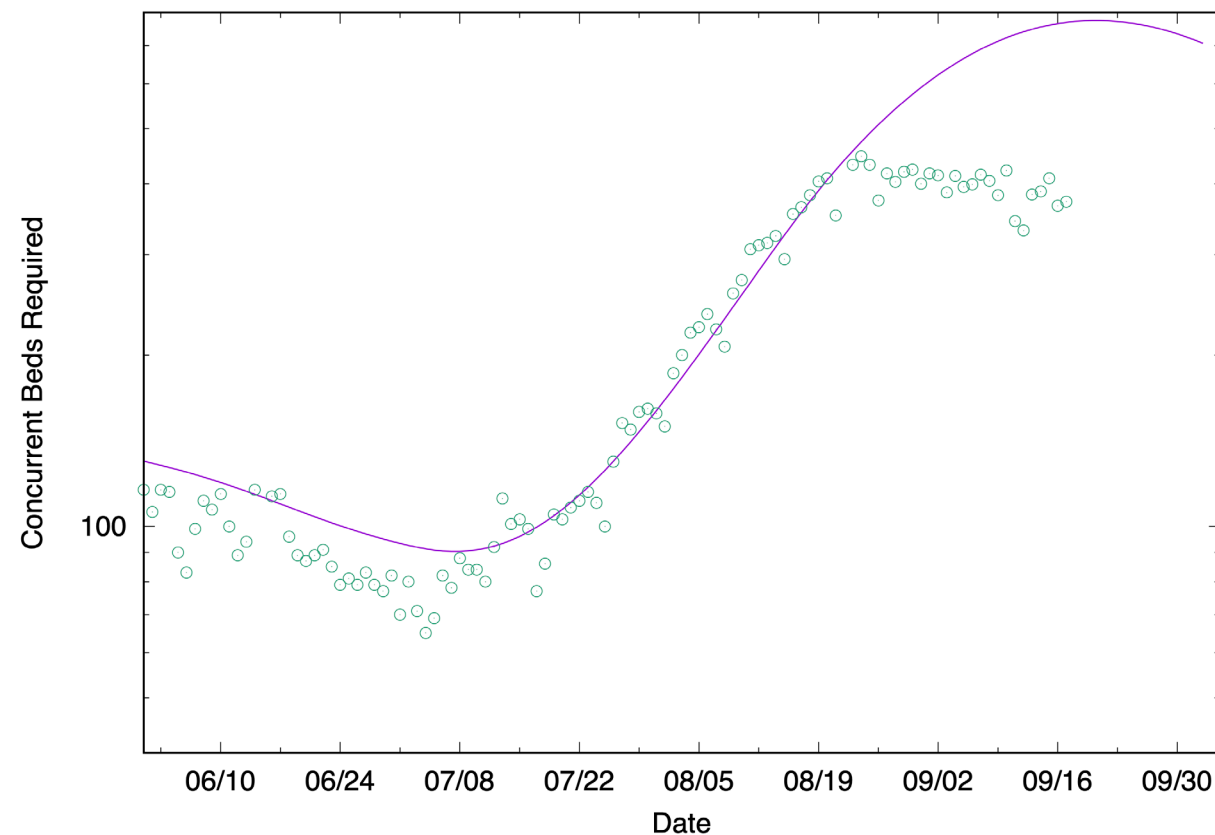
Hospital bed concurrent usage by COVID-19 patients (Statewide)

- 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 on ~19 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 and or other factors not present from March through late July or early August, 2021.
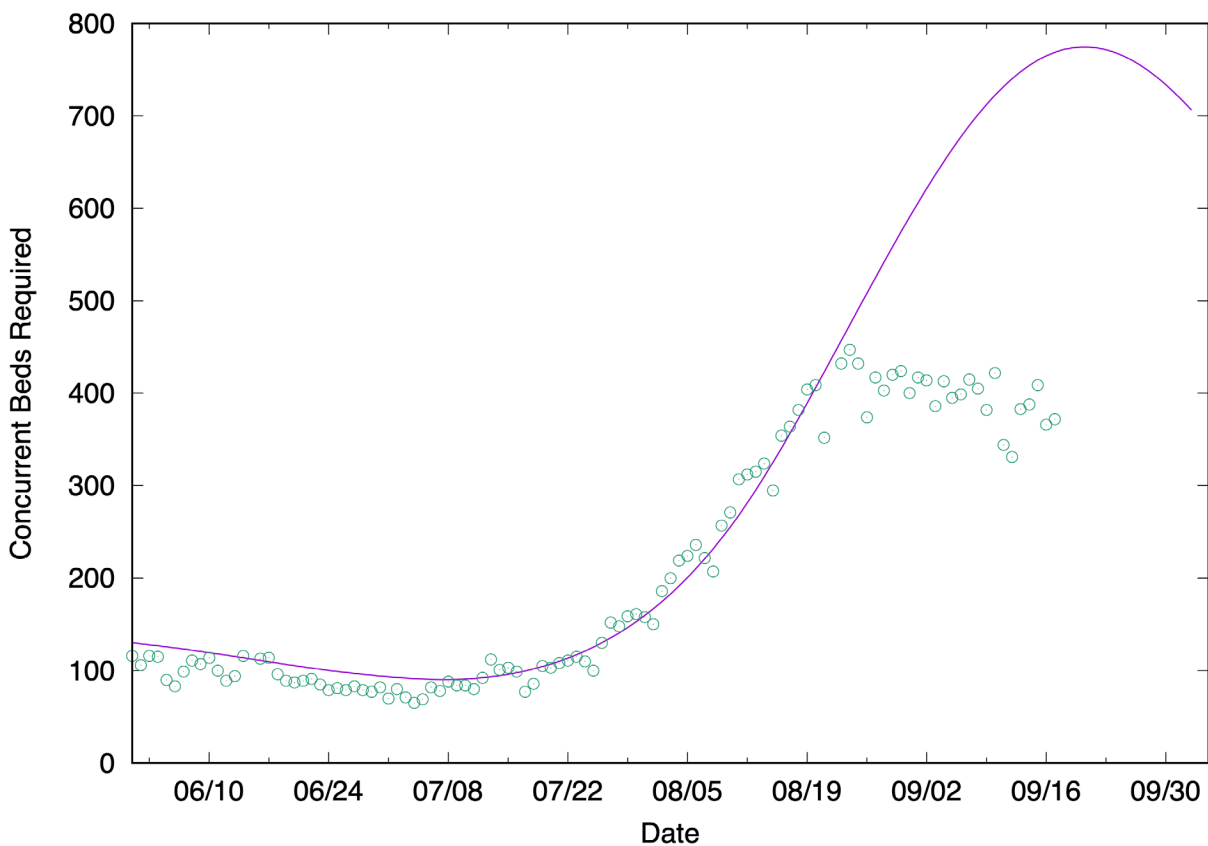
Tue Sep 21 11:06:39 2021

Tue Sep 21 11:05:38 2021