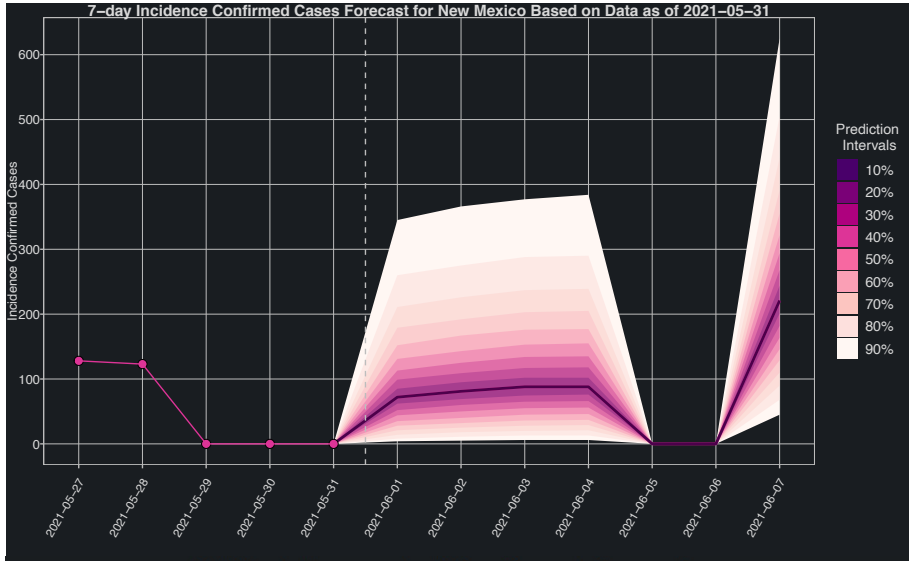
Modeling & Forecasting COVID-19 in NM

June 1, 2021

NNSA
National Nuclear Security Administration

Short- & Long-Term Forecast for NM: Cases



6–Week Forecast of Confirmed Cases for New Mexico Based on Data as of 2021–05–31

Week	Best Case (5th Percentile)	Middle Case (50th Percentile)^	Worst Case (95th Percentile)
2021–05–31		202,821*	
2021–06–07	202,888	203,374	204,913
2021–06–14	202,926	203,806	206,810
2021–06–21	202,954	204,180	208,545
2021–06–28	202,973	204,521	210,374
2021–07–05	202,991	204,839	212,124
2021–07–12	203,003	205,168	213,932

*Last reported confirmed cases count
^Closest–matching scenario

6–Week Forecast of Daily Average of Confirmed Cases for New Mexico Based on Data as of 2021–05–31

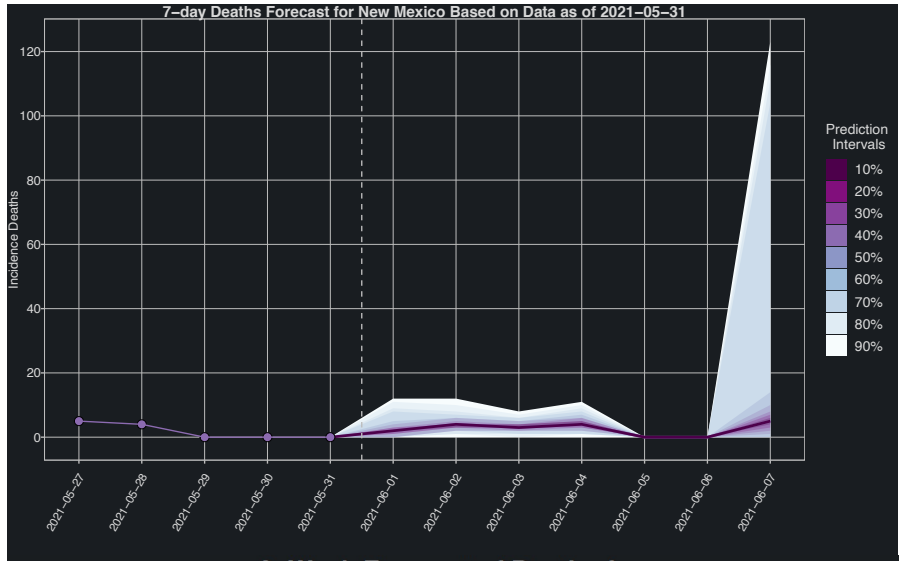
Week	Best Case (5th Percentile)	Middle Case (50th Percentile)^	Worst Case (95th Percentile)
2021–05–31		91*	
2021–06–07	10	79	299
2021–06–14	5	62	271
2021–06–21	4	53	248
2021–06–28	3	49	261
2021–07–05	3	45	250
2021–07–12	2	47	258

*Last reported confirmed cases count
^Closest–matching scenario

So what?

The daily number of cases are expected to range between 50 and 80 in the next few weeks

Short- & Long-Term Forecast for NM: Deaths



6–Week Forecast of Deaths for New Mexico Based on Data as of 2021–05–31

Week	Best Case (5th Percentile)	Middle Case (50th Percentile)^	Worst Case (95th Percentile)
2021–05–31		4,263*	
2021–06–07	4,272	4,286	4,404
2021–06–14	4,289	4,317	4,502
2021–06–21	4,307	4,418	4,557
2021–06–28	4,328	4,451	4,624
2021–07–05	4,350	4,483	4,703
2021–07–12	4,372	4,526	4,750

*Last reported deaths count
^Closest–matching scenario

6–Week Forecast of Daily Average of Deaths for New Mexico Based on Data as of 2021–05–31

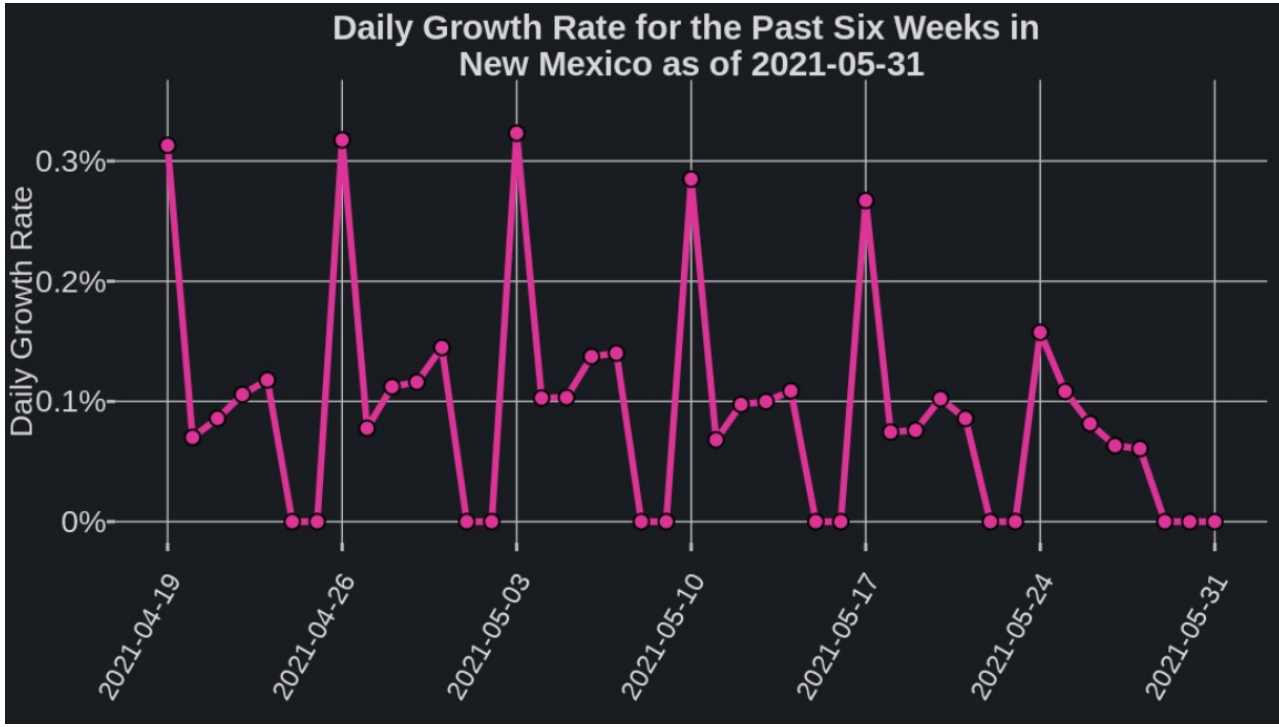
Week	Best Case (5th Percentile)	Middle Case (50th Percentile)^	Worst Case (95th Percentile)
2021–05–31		3*	
2021–06–07	1	3	20
2021–06–14	2	4	14
2021–06–21	3	14	8
2021–06–28	3	5	10
2021–07–05	3	5	11
2021–07–12	3	6	7

*Last reported confirmed deaths
^Closest–matching scenario

So what?

The <u>daily</u> number of deaths are expected to range between 3 and 14 in the next few weeks

Growth Rate for NM



6-Week Forecast of the Average Weekly Growth Rate for New Mexico Based on Data as of 2021-05-31

Week	Best Case (5th Percentile)	Middle Case (50th Percentile)^	Worst Case (95th Percentile)
2021-05-31		0.045%*	
2021-06-07	0.0047%	0.039%	0.15%
2021-06-14	0.0027%	0.030%	0.13%
2021-06-21	0.0020%	0.026%	0.12%
2021-06-28	0.0013%	0.024%	0.12%
2021-07-05	0.0013%	0.022%	0.12%
2021-07-12	0.00085%	0.023%	0.12%

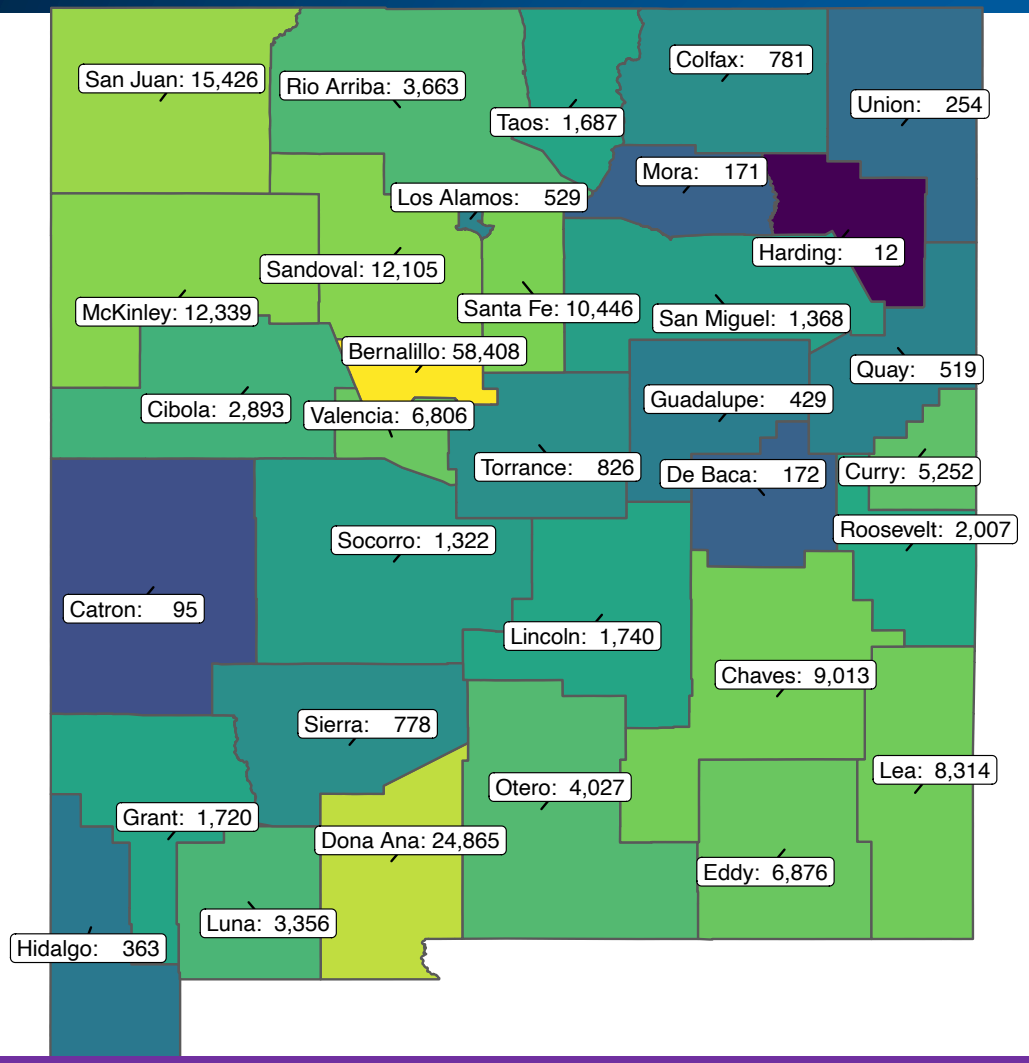
*Last weekly mean daily growth rate

^Closest-matching scenario

So what?

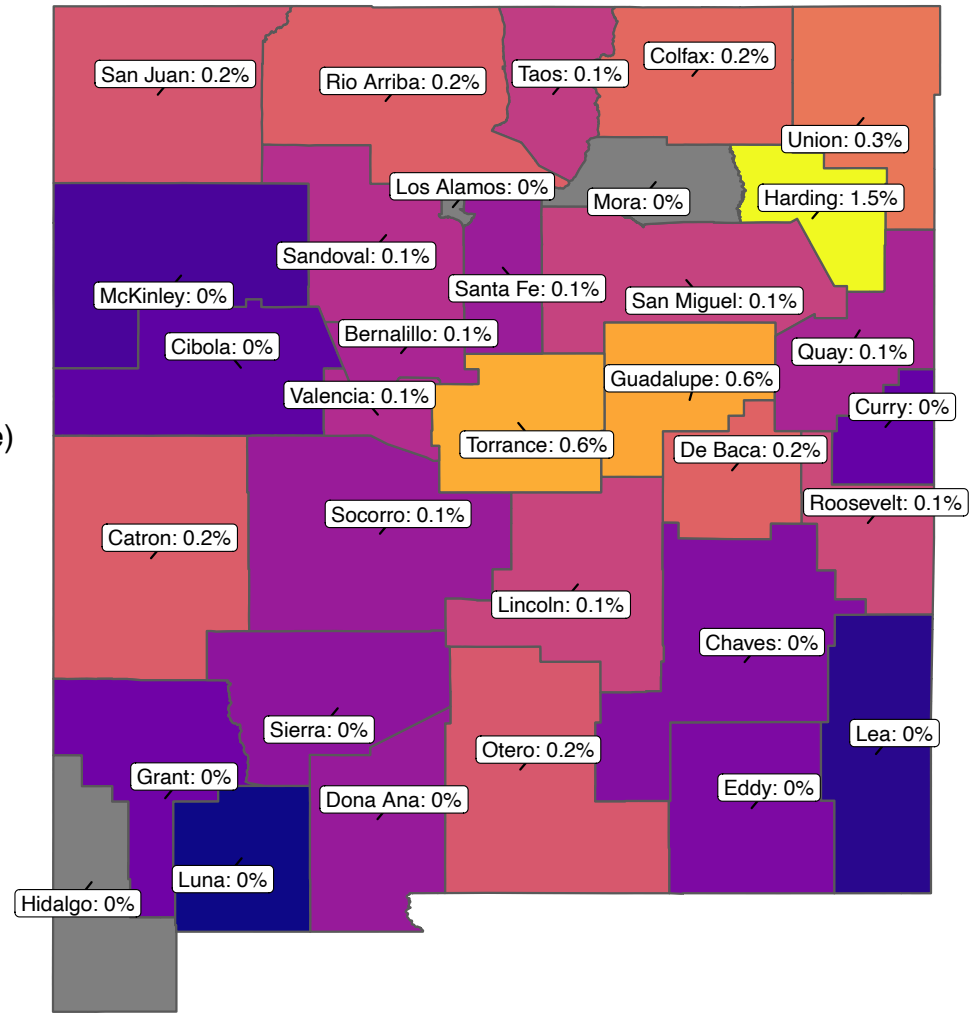
As of May 31st, the average growth rate in NM is at 0.045% (down from two weeks ago)

Cumulative Cases & Daily Growth Rate for NM: May 31



Cases (Log Scale)

22,026
2,981
403
55



7–day–average daily growth rate (%)

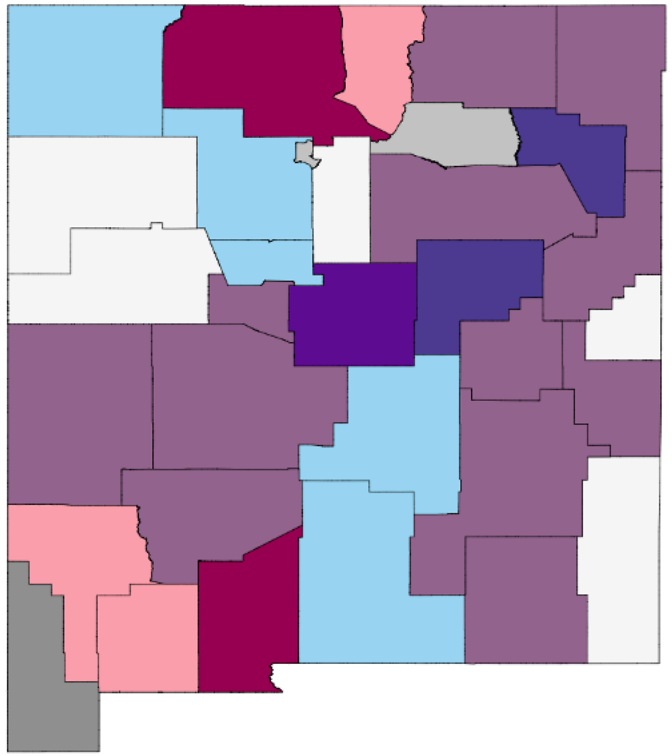
0.5
0.1
0.0

So what? Torrance, Guadalupe, Harding, Rio Arriba, San Juan, Catron, Otero, De Baca have slightly elevated growth

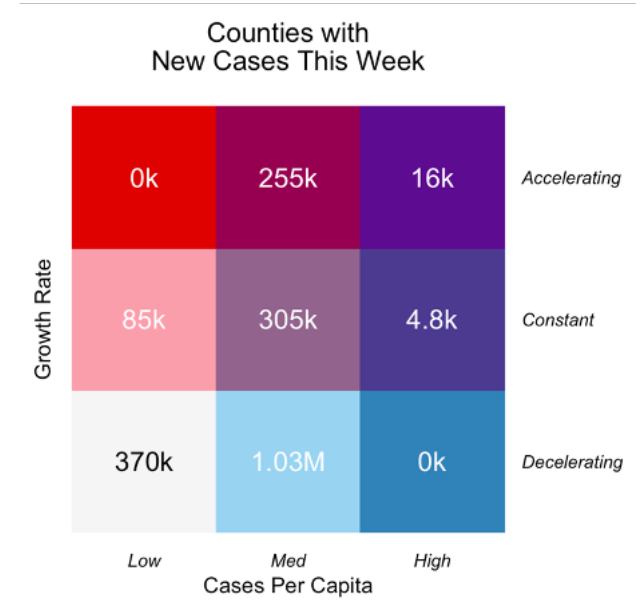
*Growth rate is in cumulative cases

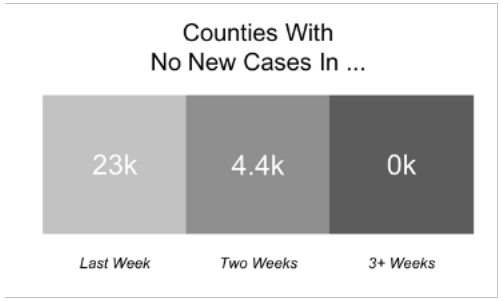
Weekly Growth Rate for NM: Another View (May 31)

COVID-19 across New Mexico
A 7-day moving window comparison
May 31, 2021



Impacted New Mexicans





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

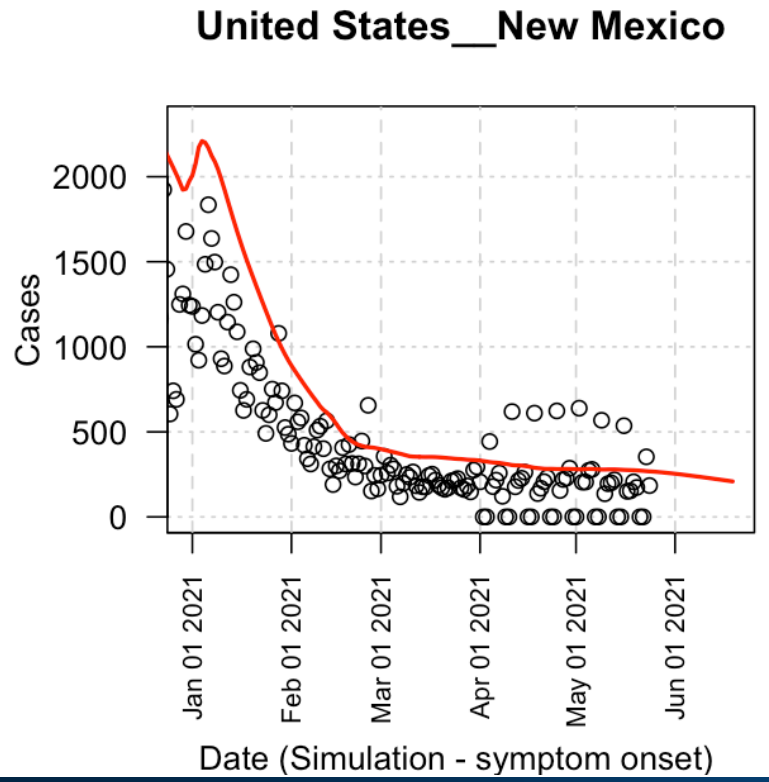
So what?

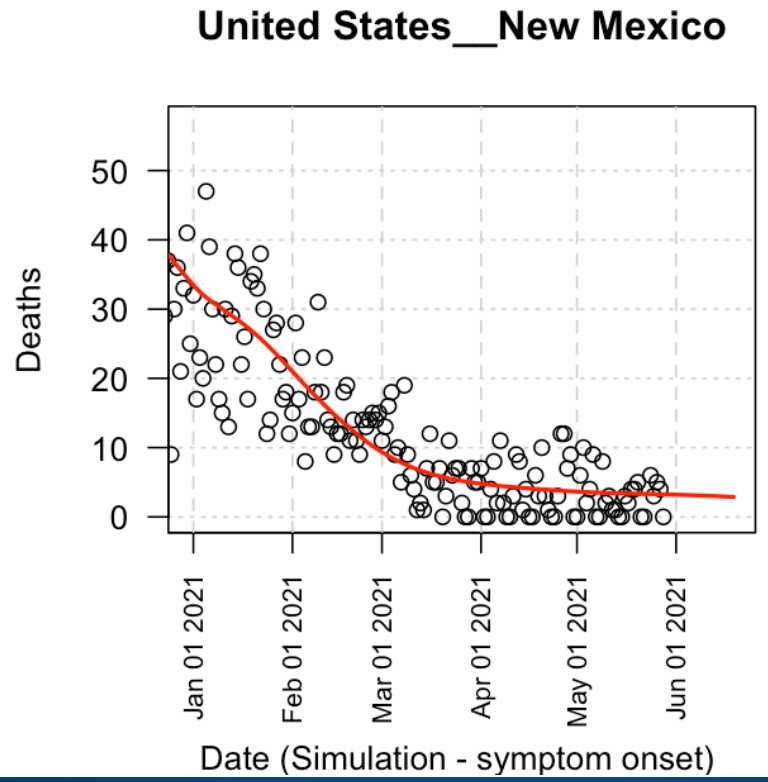
- Most people in New Mexico are living in a county that is medium per-capita case counts with a decelerating growth
- Rio Arriba, Torrance, and Dona Ana are accelerating

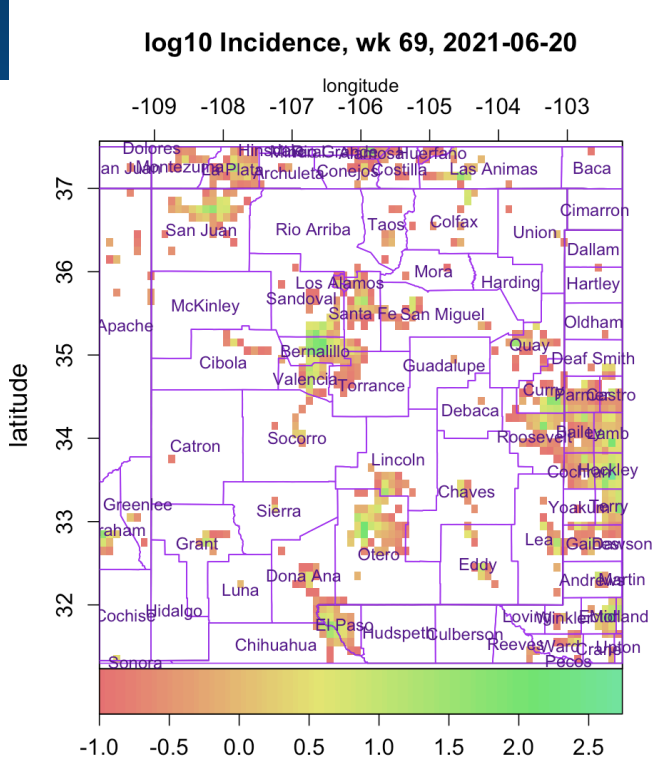
Low <10 cases/100k per week
Med 10-99 cases/100k per week
High >100 cases/100k per week

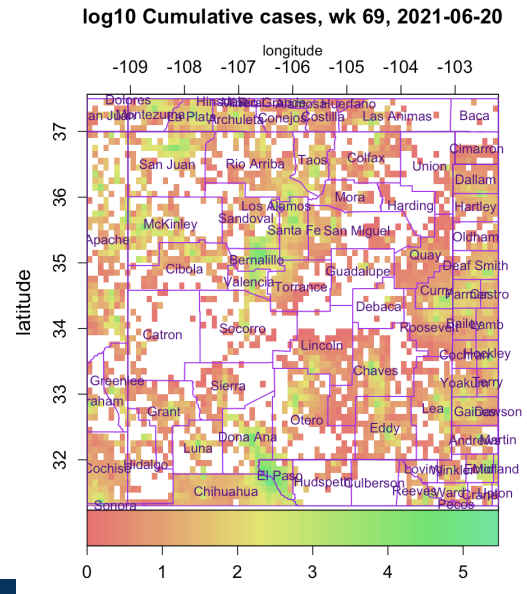
1 Jun 2021: EpiGrid modeling

- NM daily incidence is slowly decreasing.
- NM deaths similar to model.
  - The model does not account for better vaccination of cohorts with higher death rates, nor the compensating effect of B.1.1.7 being the major variant.



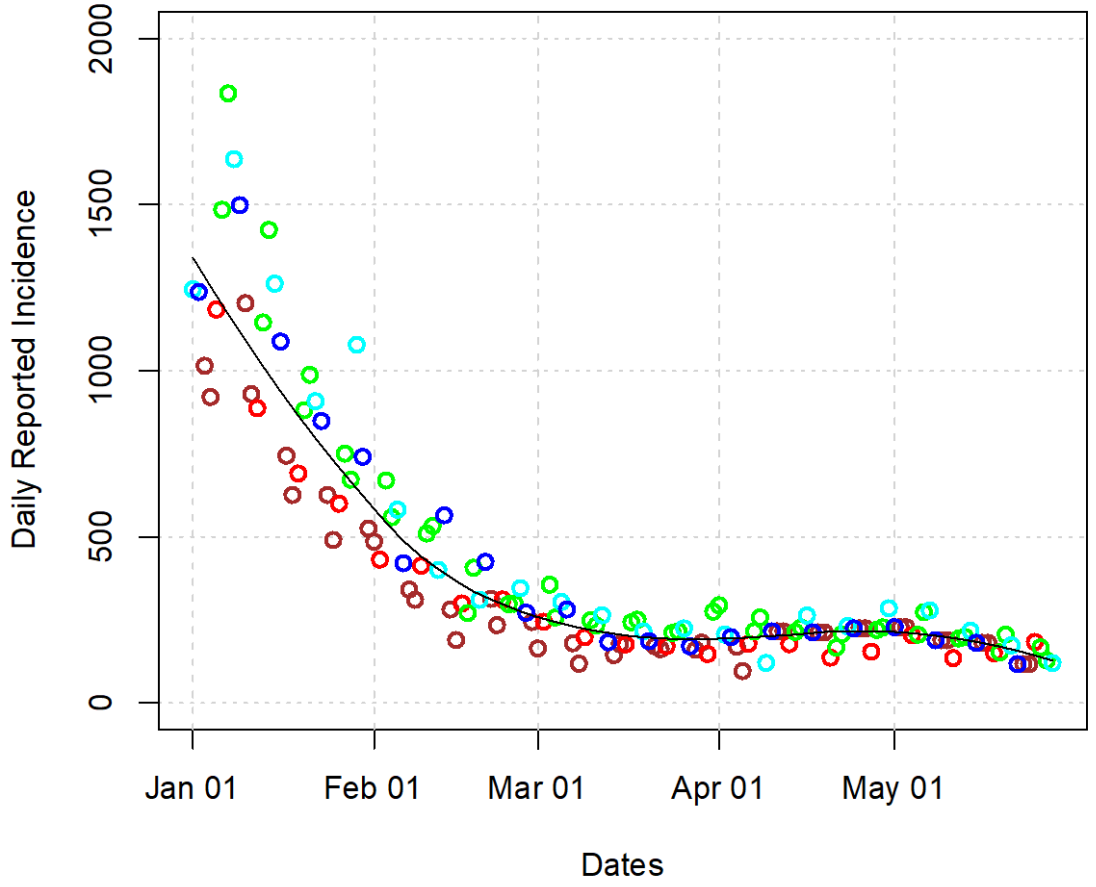






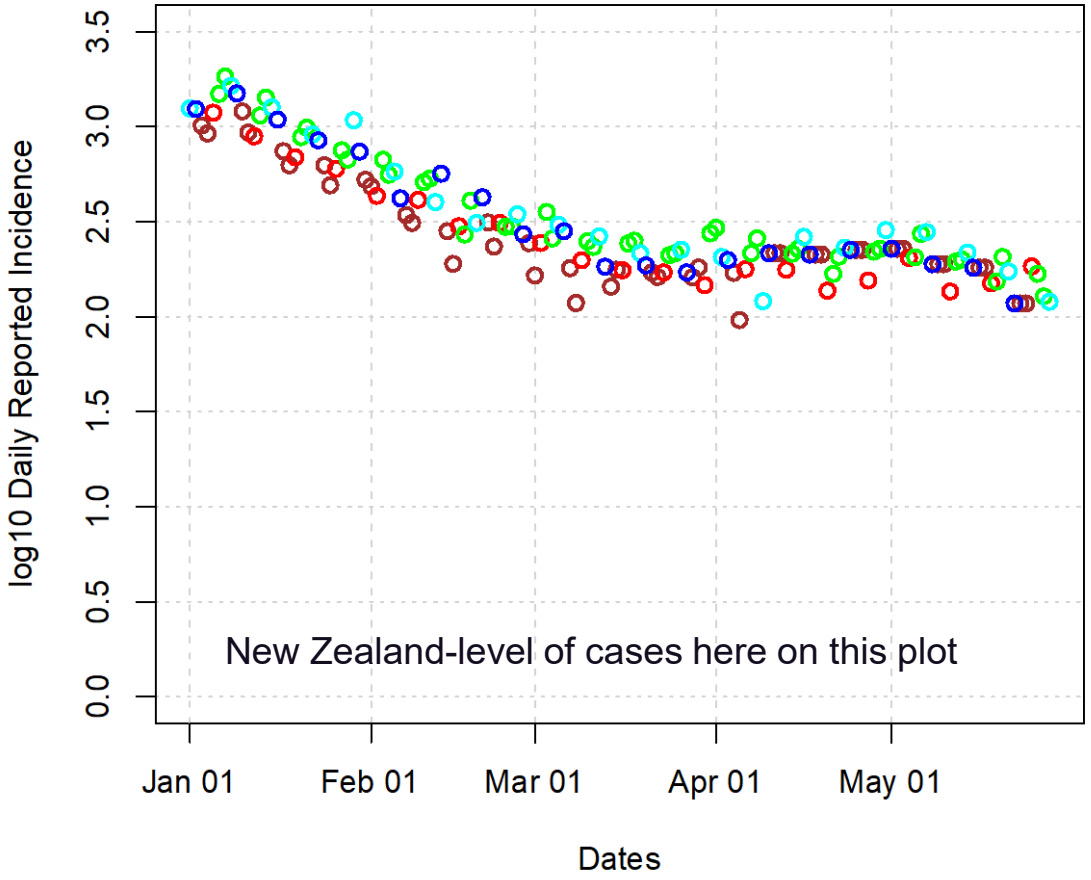
A look at the raw incidence data

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



Cases appear to be declining.

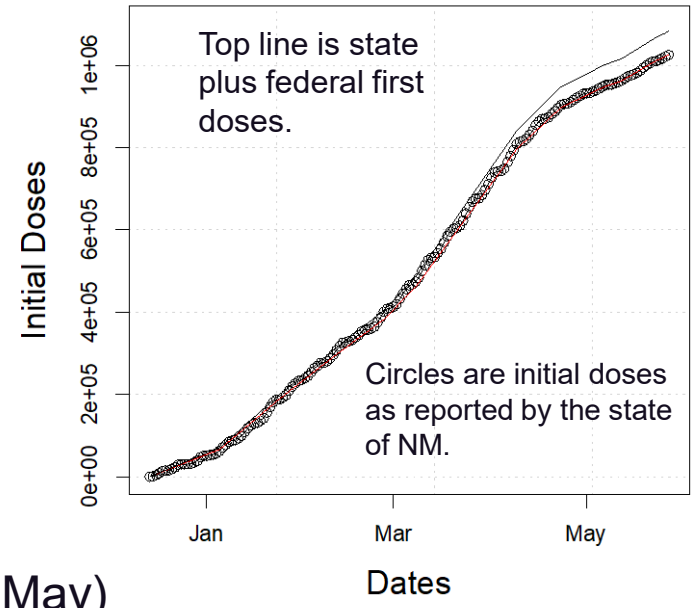
The 190 cases in the Lea county correctional facility are removed from data reported on March 26th. The 1/3 of reported cases that were > 2 weeks prior were removed from March 24th. Case reported for weekends starting April 10-12th are each divided by 3 to estimate individual day counts.

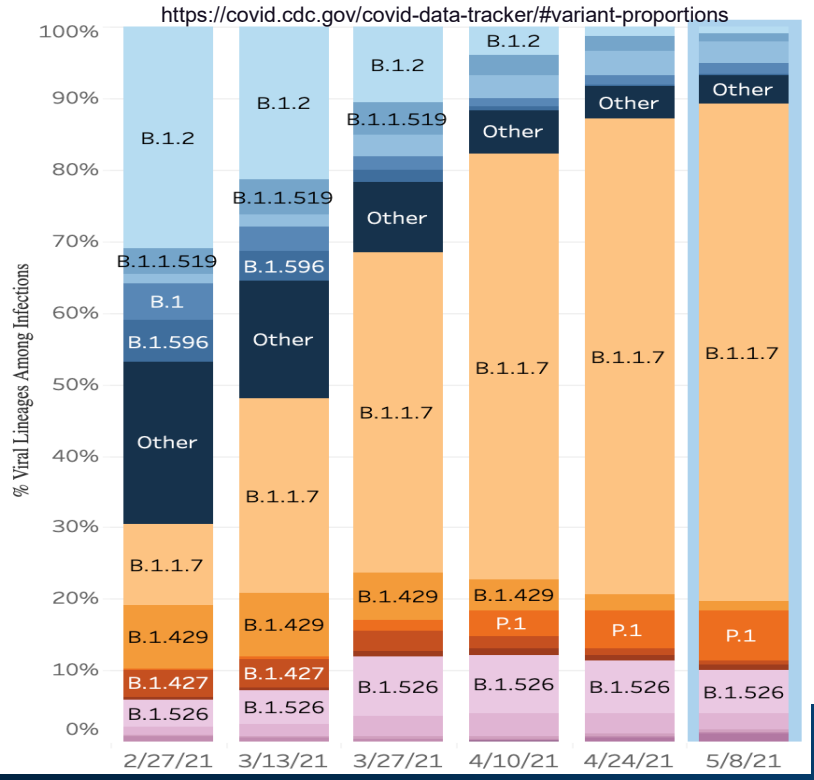


1 Jun 2021 Model (Mechanistic) – more details and information

- **~1,096,000 first doses have been administered in NM (Federal and State).**
  - Federal and state doses attributed to counties according to data provided by state of NM
- **Transmission is based on mobility with modifications due to PHO's and the red/yellow/green/turquoise (RYGT) framework.**
  - Public health orders (PHO) and public behavior similar to previous models.
  - There are no extrapolations to RYGT assignments.
  - Currently modeling turquoise counties as a progressively increasing force-of-infection.
- **Daily reported cases in El Paso are decreasing slowly.**

Vaccination sped up when 12-15 year olds became eligible





B.1.1.7 is primary variant in US
- "UK variant"

B.1.617.2 is present (low percentages early May)
- "Indian variant"
- probably even more contagious than B.1.1.7.

P.1 is increasing in US and NM
- "Brazilian variant"

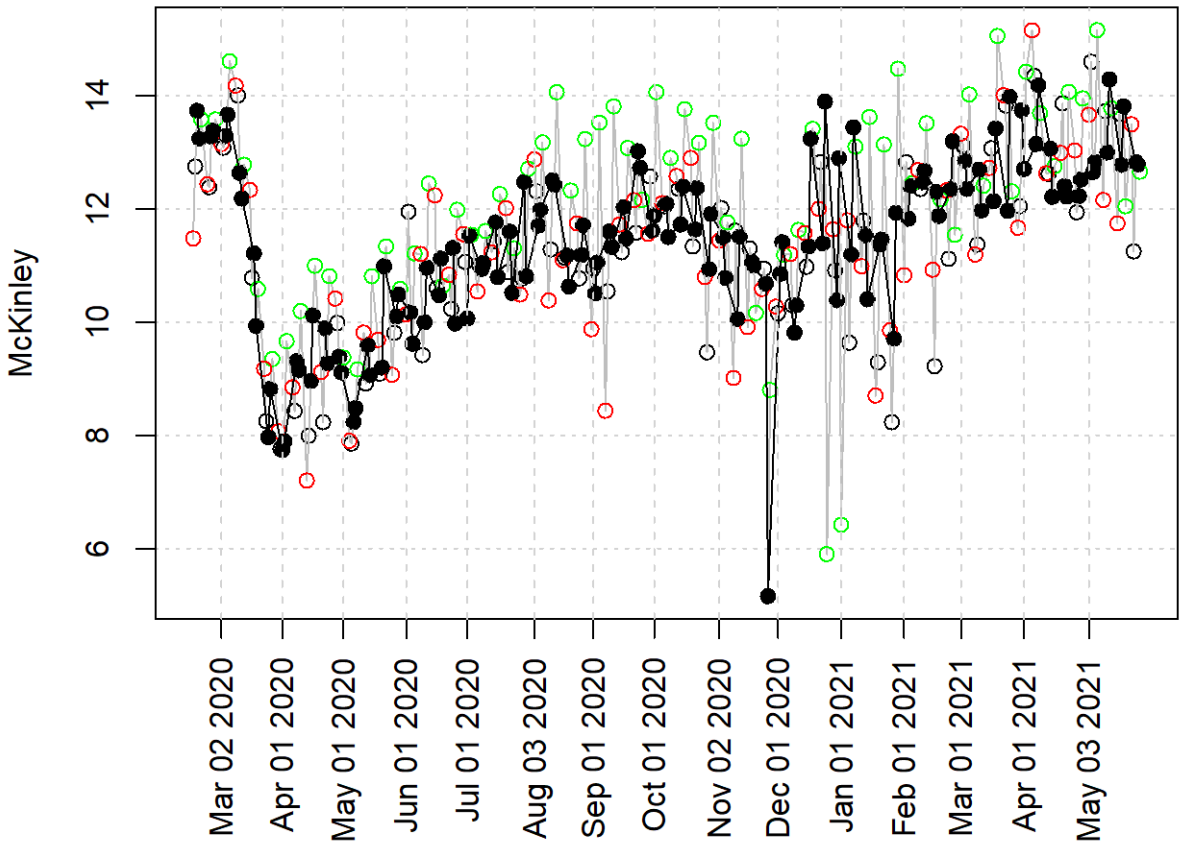
- **Baseline EpiGrid results reflects B.1.1.7 variant of SARS-CoV-2.**
  - Assumes a 50% increase in contagion/force of infection per Volz, Ferguson, et al.

T-80 Mobility – northern counties (data only)

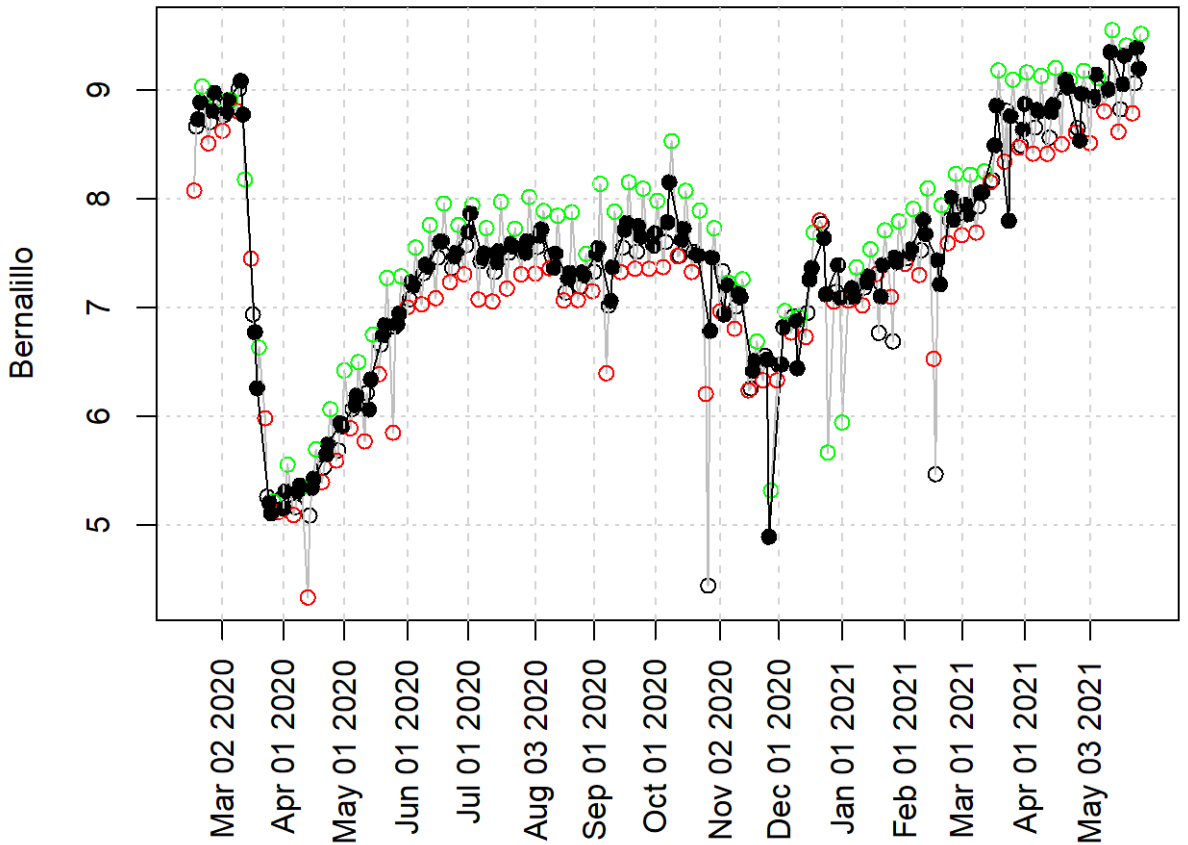
- Weekends not shown
- Monday
- Wednesday/Thursday
- Friday (usually higher)

Slow increase over past several weeks: Bernalillo, San Juan, Santa Fe, Valencia
Very slight increase: Rio Arriba, Sandoval, Taos
Stable: Los Alamos, McKinley (also most highly vaccinated counties …)

McKinley



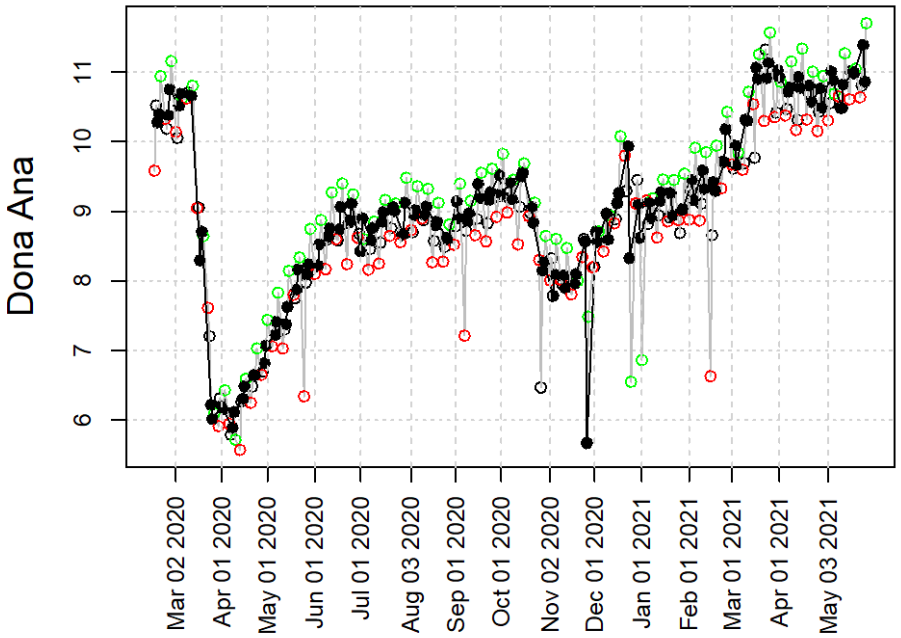
Bernalillo



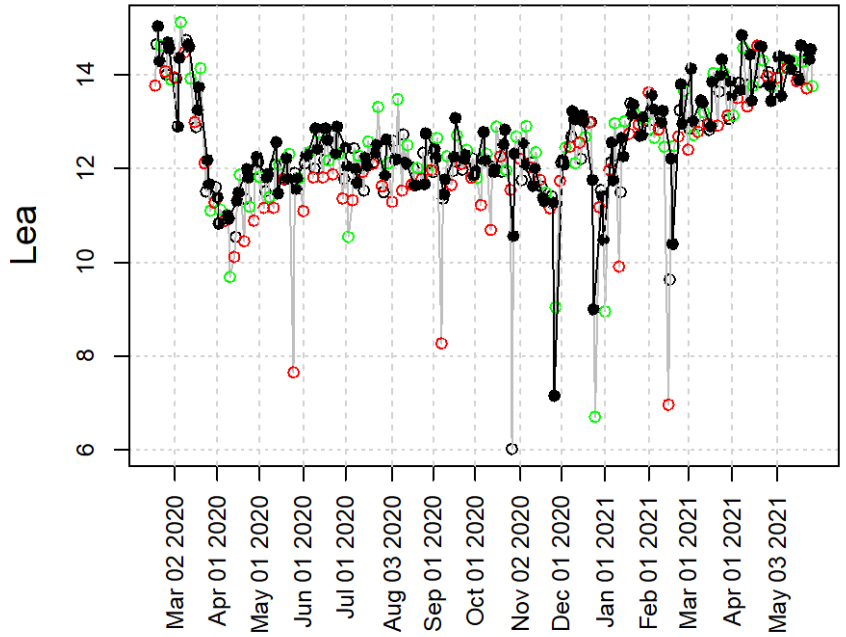
T-80 Mobility – southern counties and Curry (data only)

Rising: Chaves, Socorro, Grant, DA, Lea
Flat: Eddy, Luna, Otero, Roosevelt
Recent decrease: Curry, Lincoln
Significantly more heterogeneity than in the northern counties.

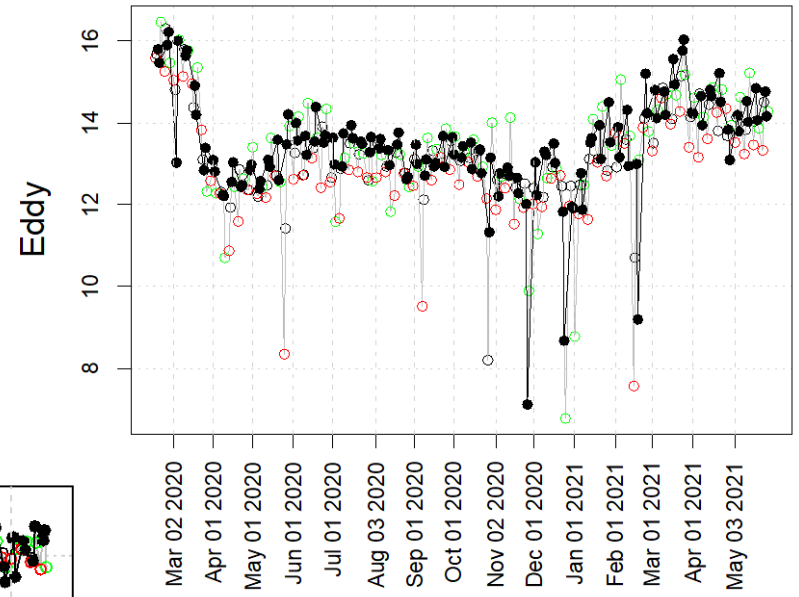
Dona Ana



Lea



Eddy



- Weekends NOT shown
- Monday
- Wednesday/Thursday
- Friday (usually higher)

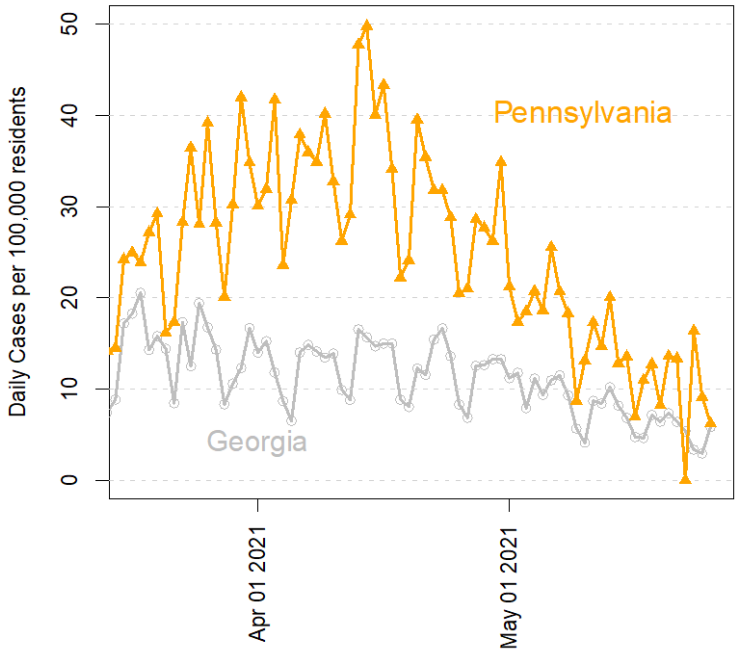
Counties to Watch

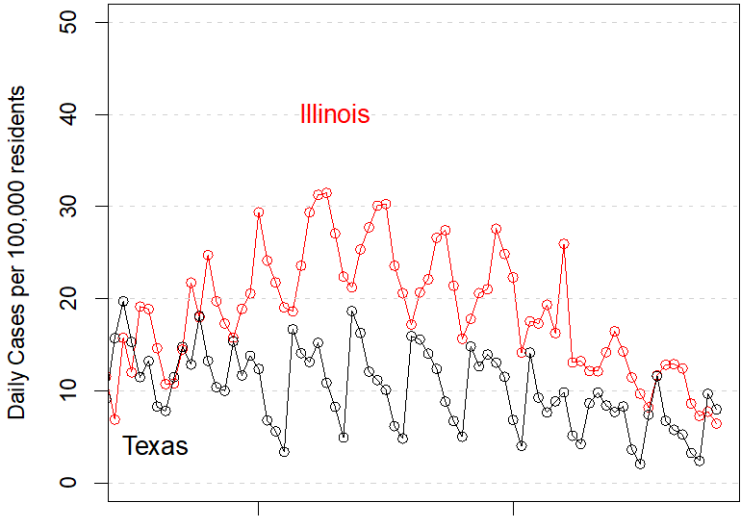
- **Curry and San Juan – There was a significant uptick in cases weeks ago. Now decreasing.**
- **DeBaca and Quay, Santa Fe – incidence was high in mid-May – is probably decreasing.**
- **Current uptick in cases:** Guadalupe, Lincoln, Rio Arriba, Roosevelt, San Miguel, **Torrance**
- **Over the past few months, case data from several counties are consistent with small outbreaks that were stopped.**

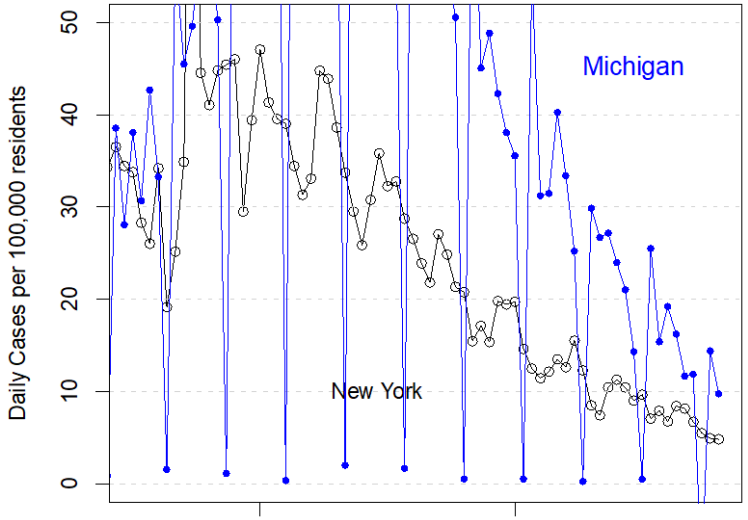
What is happening in the rest of the U.S.? The 10 most populous states

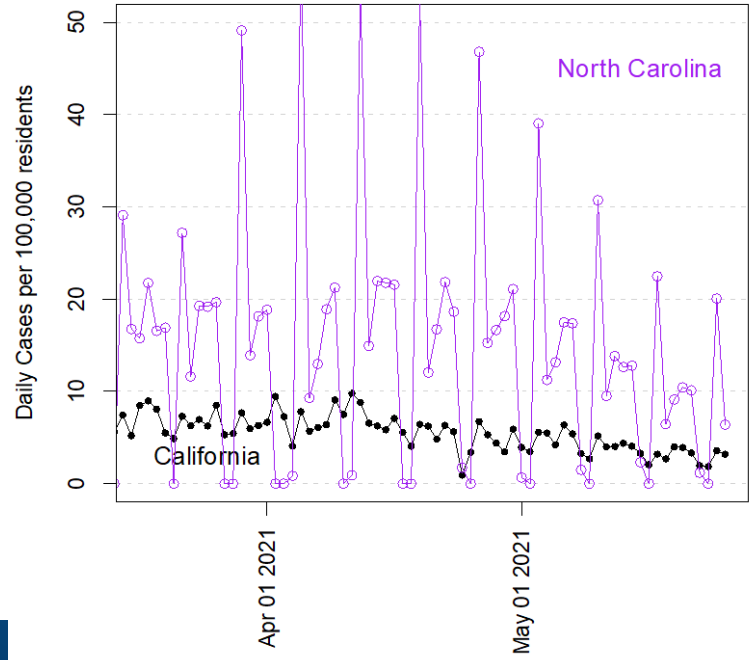
Lowest Rates: California
Not decreasing: Texas
Slight decrease: California, Pennsylvania
Decreasing: Florida, Georgia, Illinois, Michigan, Ohio, New York, North Carolina

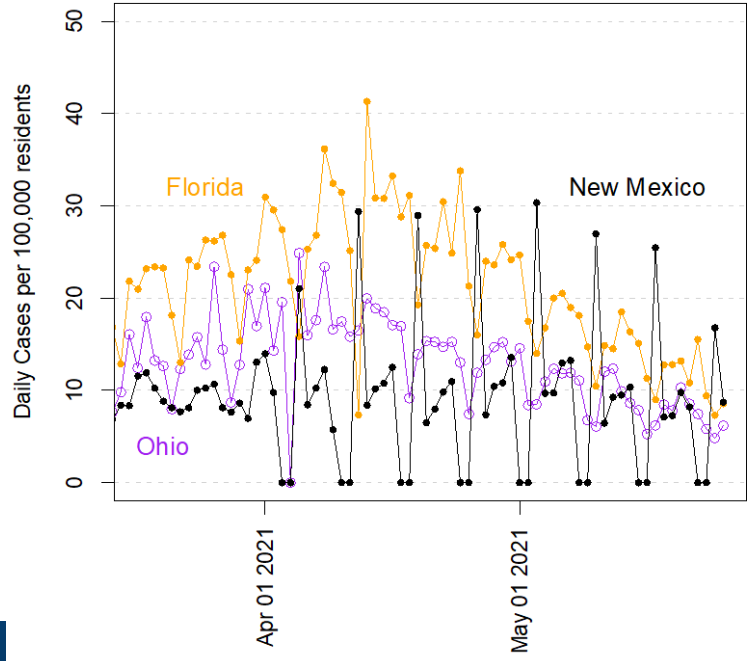
Compare with NM (lower right).











Cases (15May-28May) versus immunity (vaccination and recovered cases)