

Modeling & Forecasting COVID-19 in NM

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November 8, 2021

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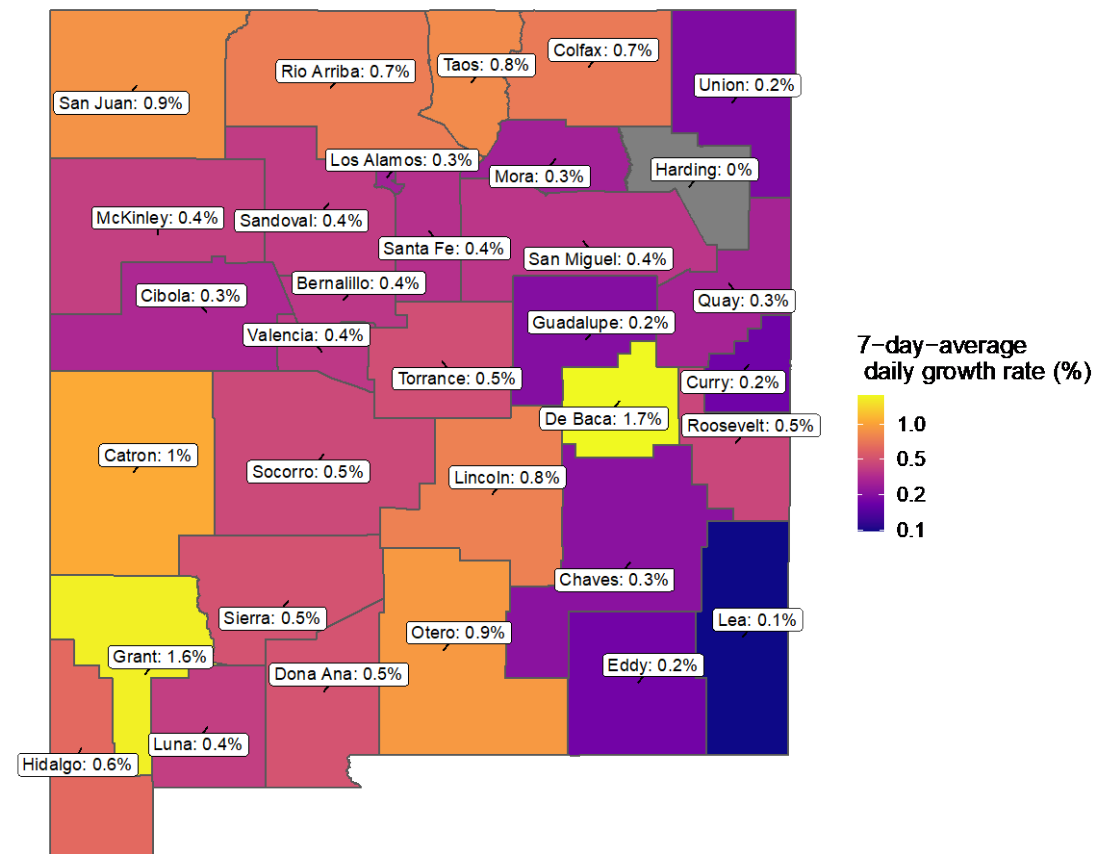
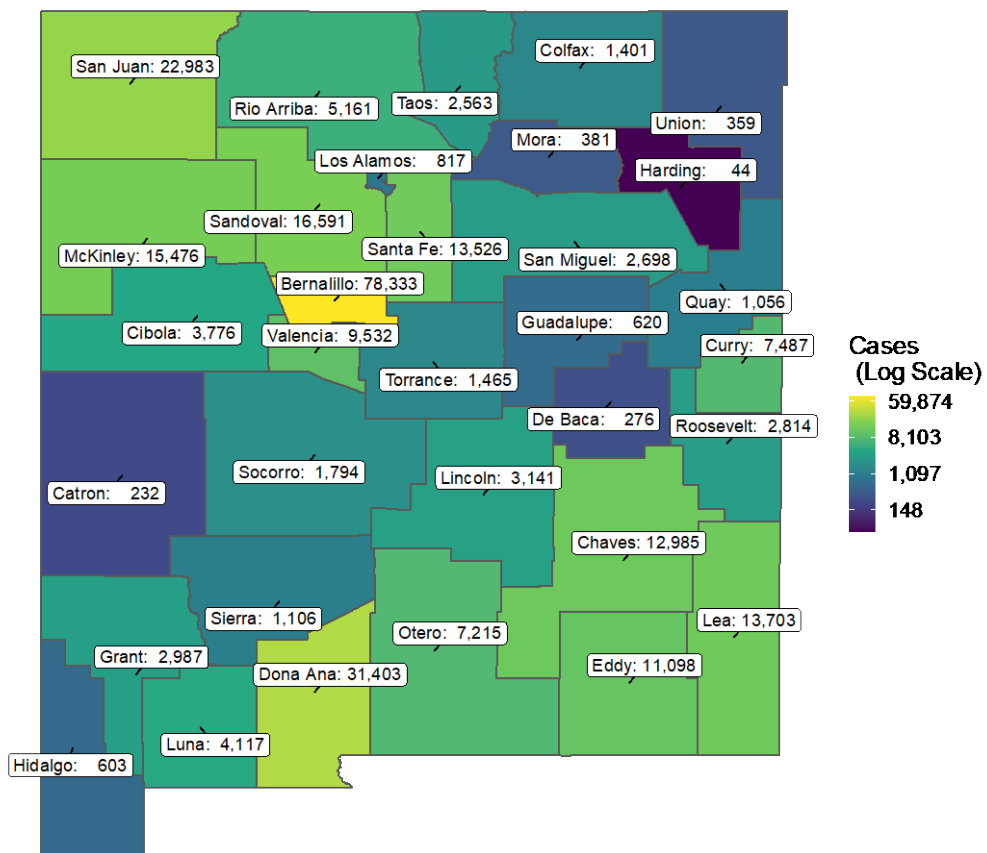
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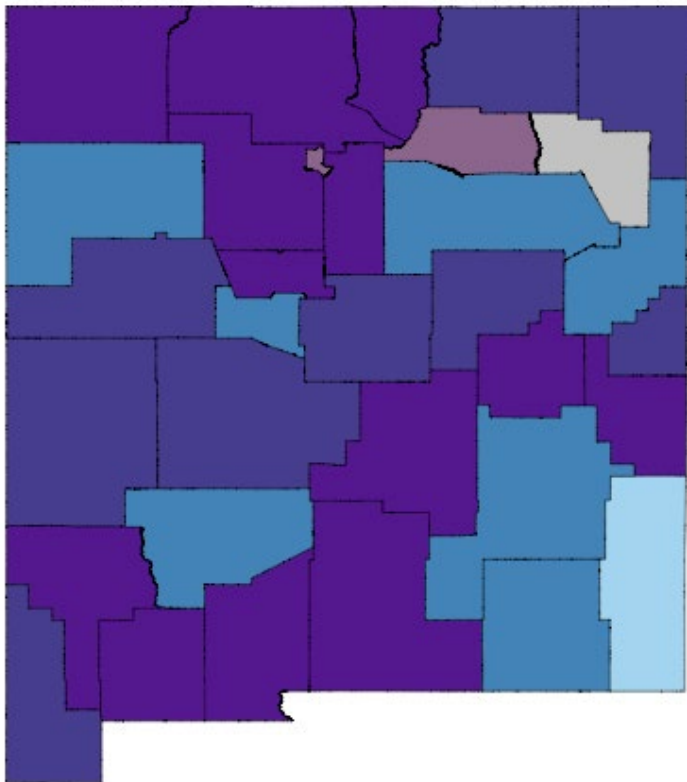
Cumulative Cases & Daily Growth Rate for NM: Nov 8



De Baca, Catron, Grant, Lincoln, Otero, San Juan, Taos, & Union have elevated cumulative growth rates

*Growth rate is in cumulative cases

Weekly Growth Rate for NM: Another View (Nov 8)



Impacted New Mexicans

Counties with New Cases This Week

Growth Rate	0k	0k	1.54M	Accelerating
	0k	23k	139k	Constant
	0k	70k	319k	Decelerating
	Low	Med	High	
	Cases Per Capita			

Counties With No New Cases In ...

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

So what?

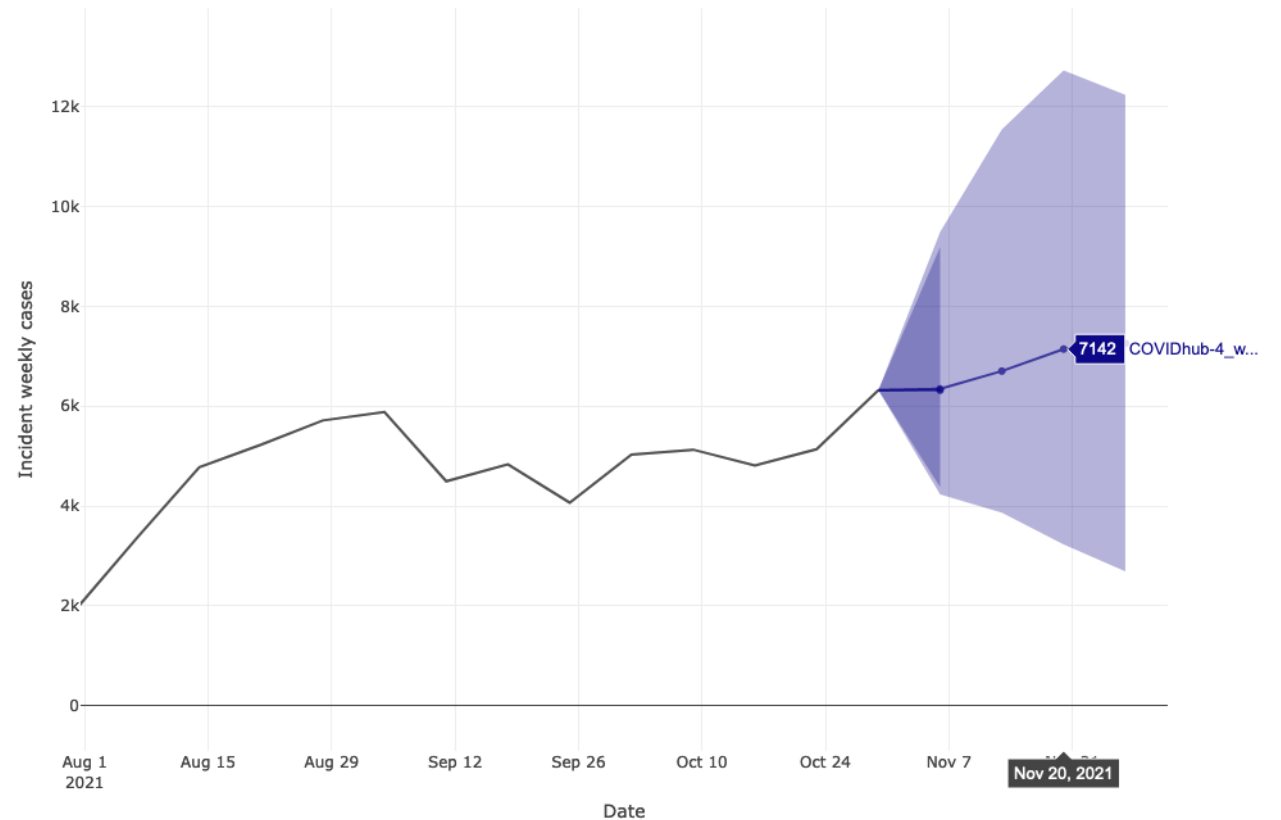
- Northwest NM, Grant, Luna, Otero, De Baca, Lincoln Roosevelt and Dona Ana counties are accelerating and have higher per-capita case counts.
- Eddy, Chaves, Quay, San Miguel, Valencia, McKinley counties are decelerating
- Most people in New Mexico are living in a county that is **high per-capita case counts and accelerating**

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

Forecast for Incident Weekly Cases in NM

The CDC ForecastHub shows a 13% increase in incident weekly cases by Nov 20, 2021 from current counts observed at 6318 (Oct 30)

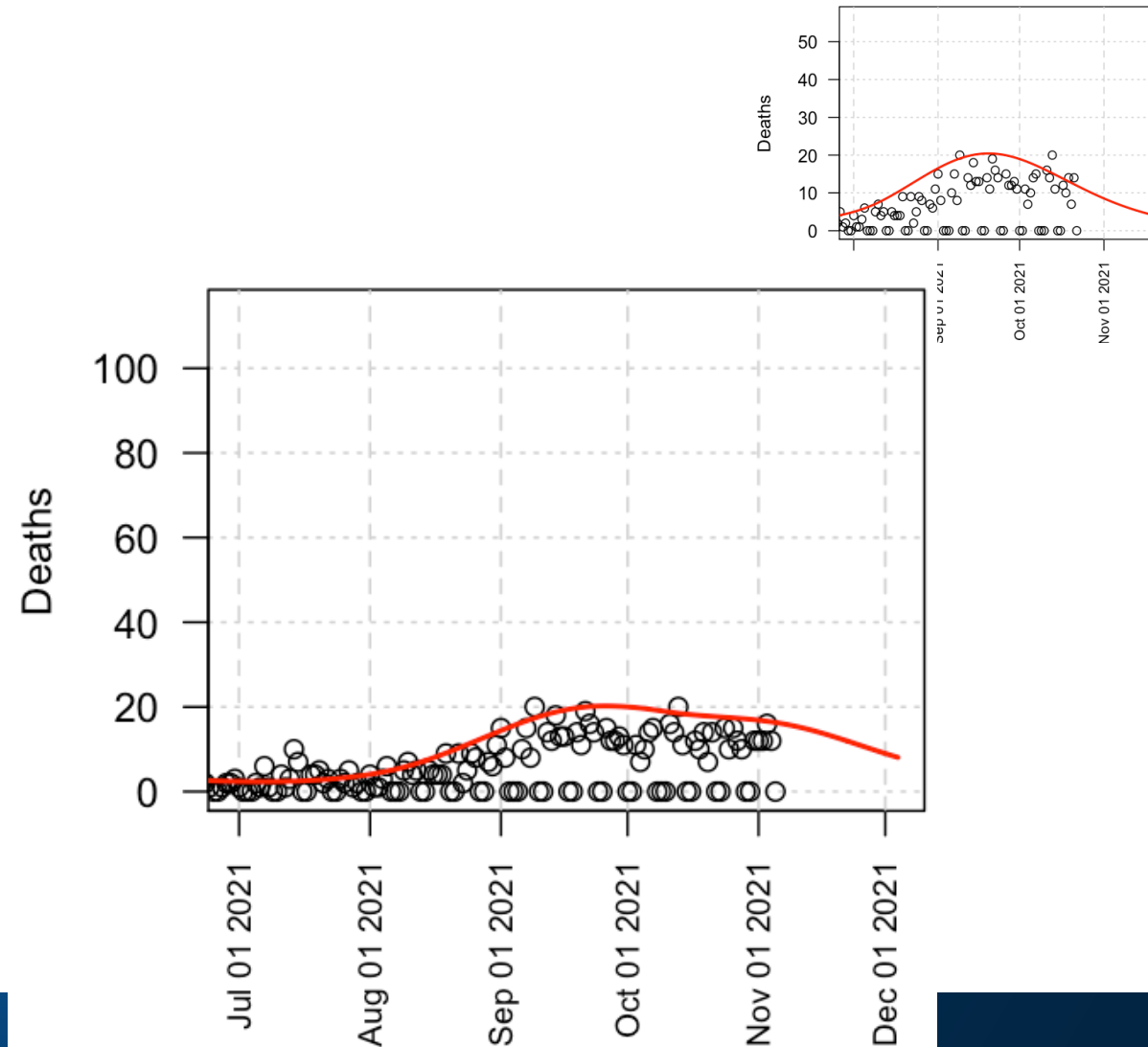
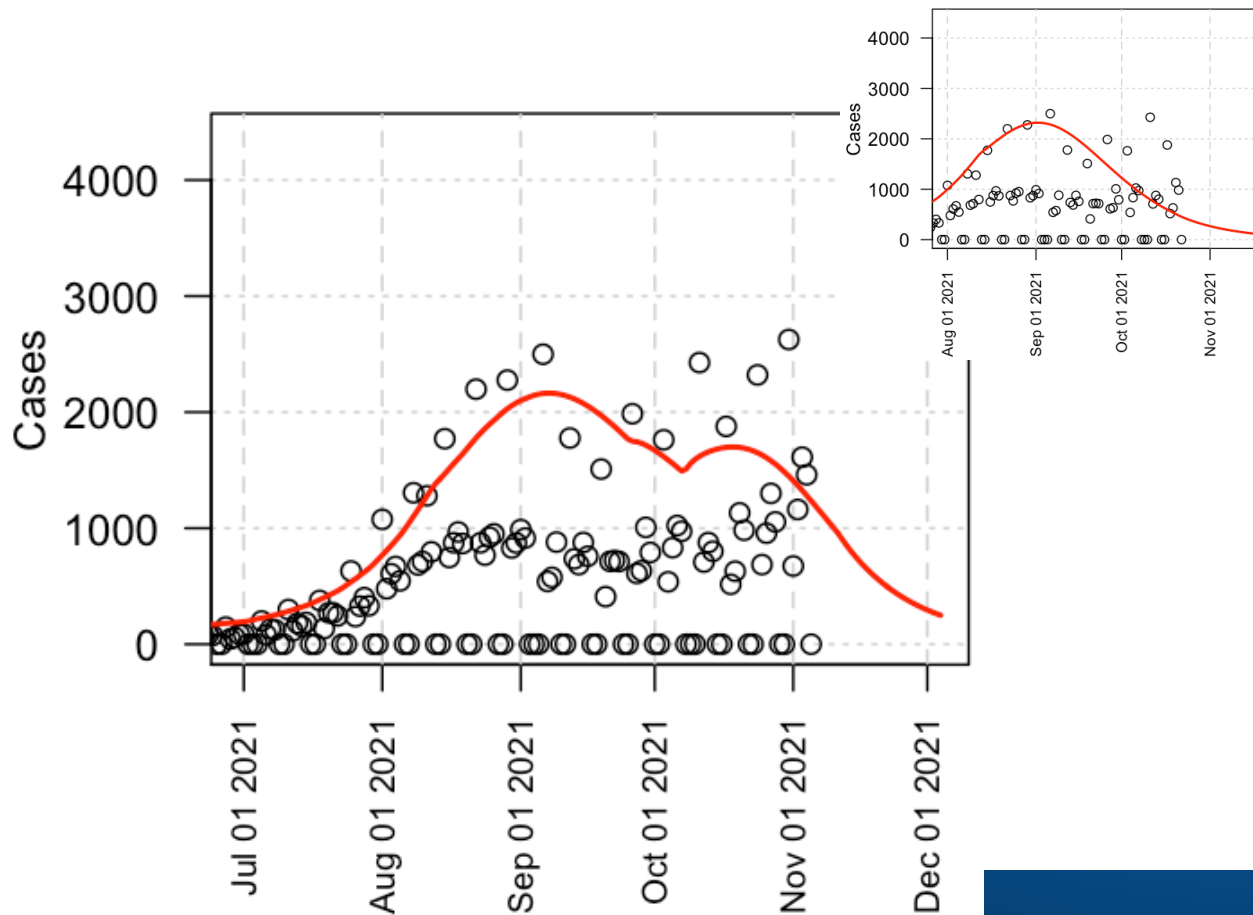


COVIDhub-4_week_ensemble prediction, COVID 19
ForecastHub

<https://viz.covid19forecasthub.org/>

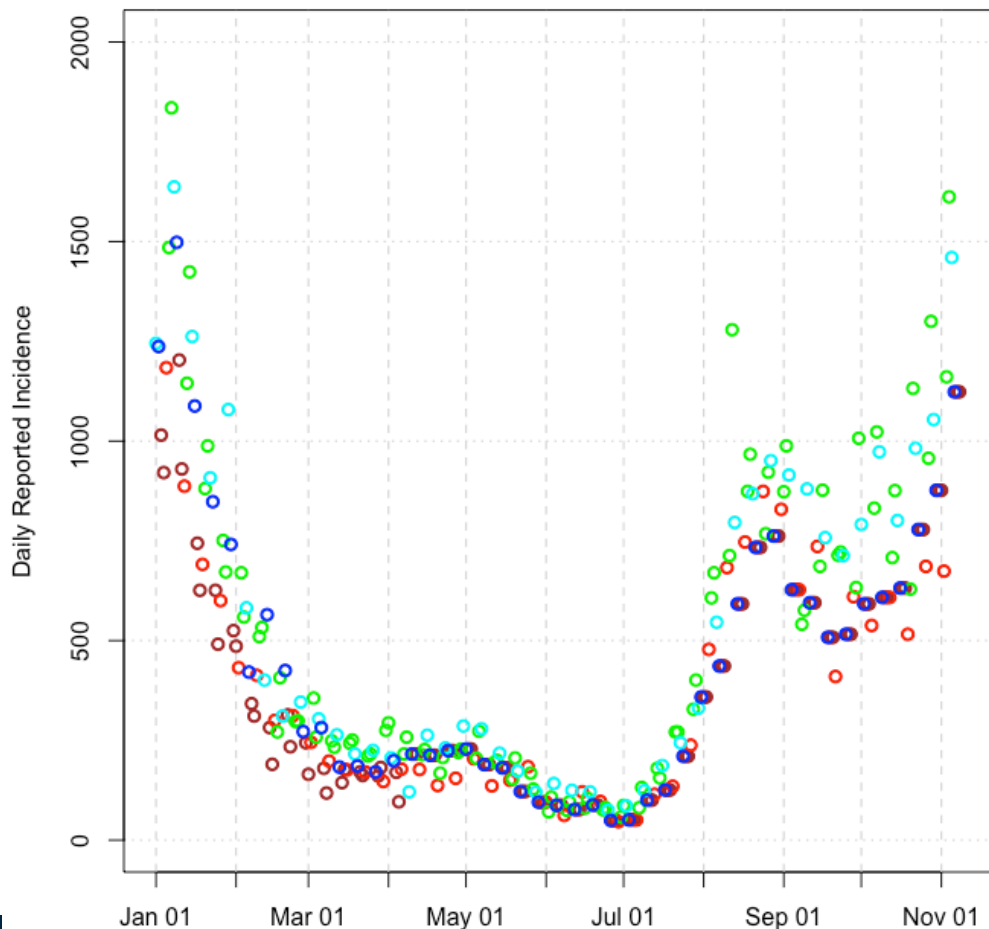
9 Nov 2021: Epigrad modeling

- New Mexico has a rising incidence rate. Hospitalization data demonstrate this. Deaths are generally consistent, but slightly low.
- Deterioration of immunity/waning immunity is a possible factor.
- Isolation protocols may have deteriorated.
- NM daily deaths show a peak in mid- to late-September.
- Deterioration of infection control likely not fully causative.



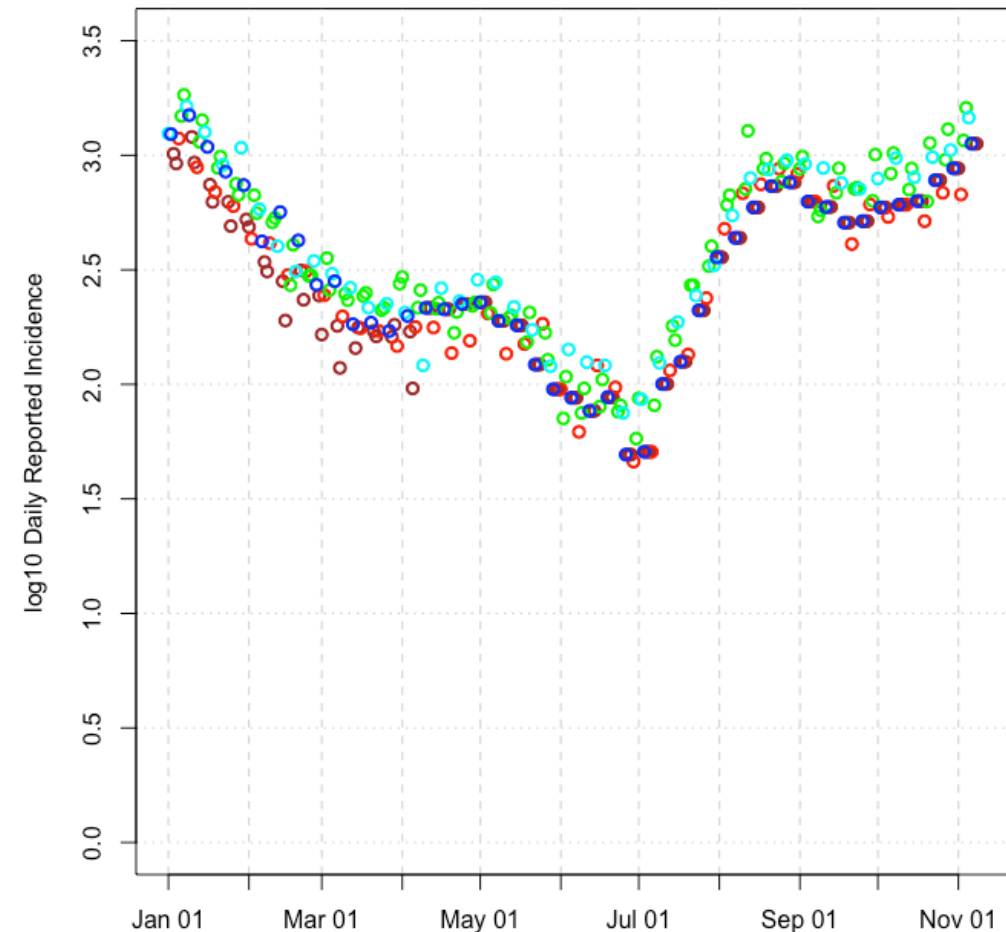
A look at the raw incidence data

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



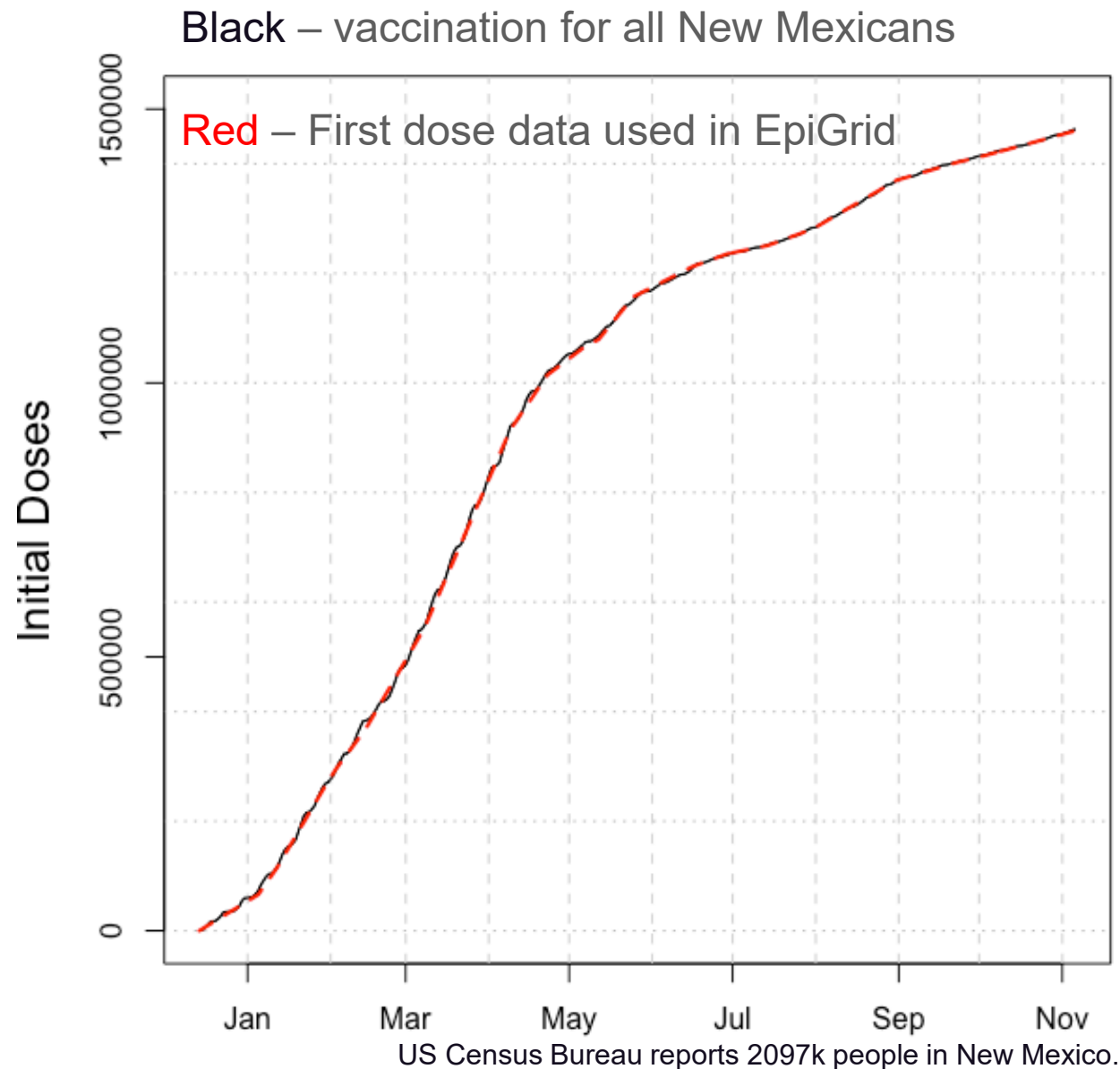
Reported cases rates are rising.

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.



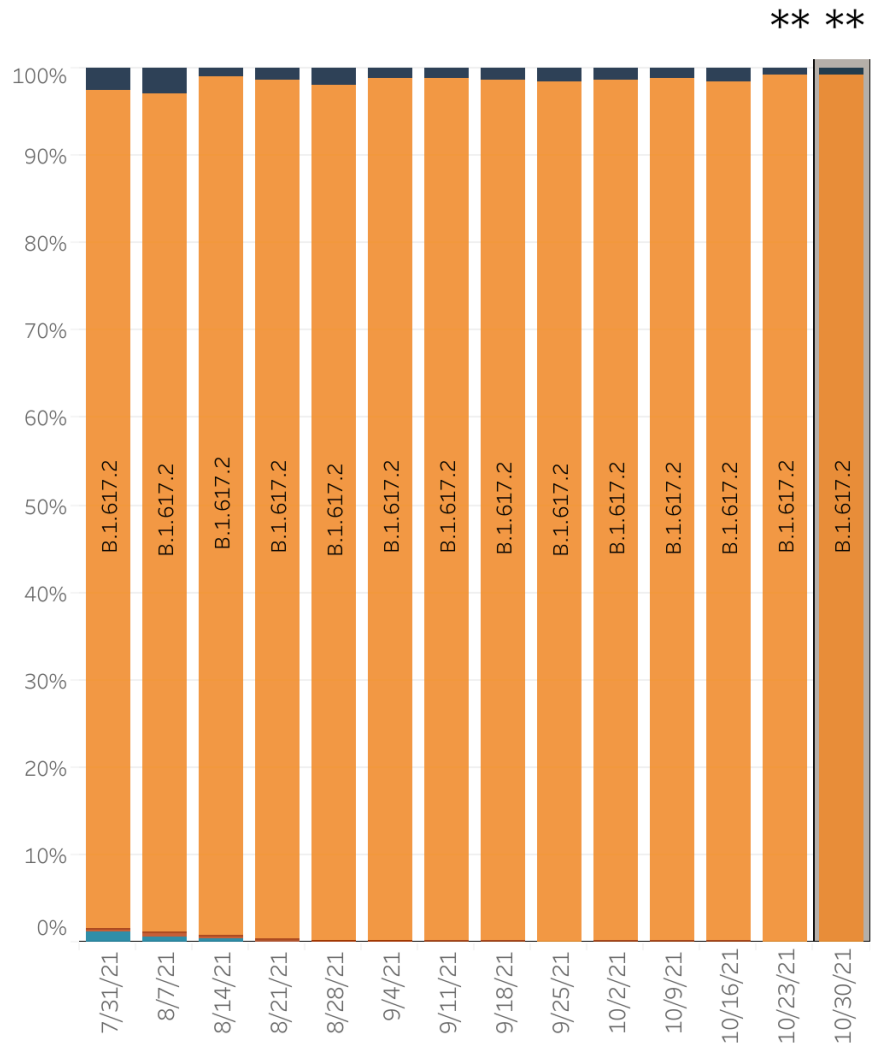
9 November 2021 Vaccine Analysis

- 1463k first doses are used in modeling.
 - ~1459k first doses have been administered in NM.
 - ~1278k completed vaccine series in NM.
 - ~69.6% of all persons in New Mexico are at least minimally vaccinated.
 - ~94.5% of all persons in New Mexico are currently eligible (~1981k).
 - 68.0/85.5 ~ 73.6% of all eligible people are vaccinated.
 - 5-11 year-olds have received ~1k first doses.
-
- The state data are consistent with waning immunity (e.g. see DOH reports)
 - This is not a surprising result, given known-immune system responses.
 - Compare with pediatric vaccine schedules where doses are generally separated by 6 months to 5 years.
 - High adoption of third/months-spaced doses in vulnerable populations will lower mortality, hospitalization, may lead to lower case rates.



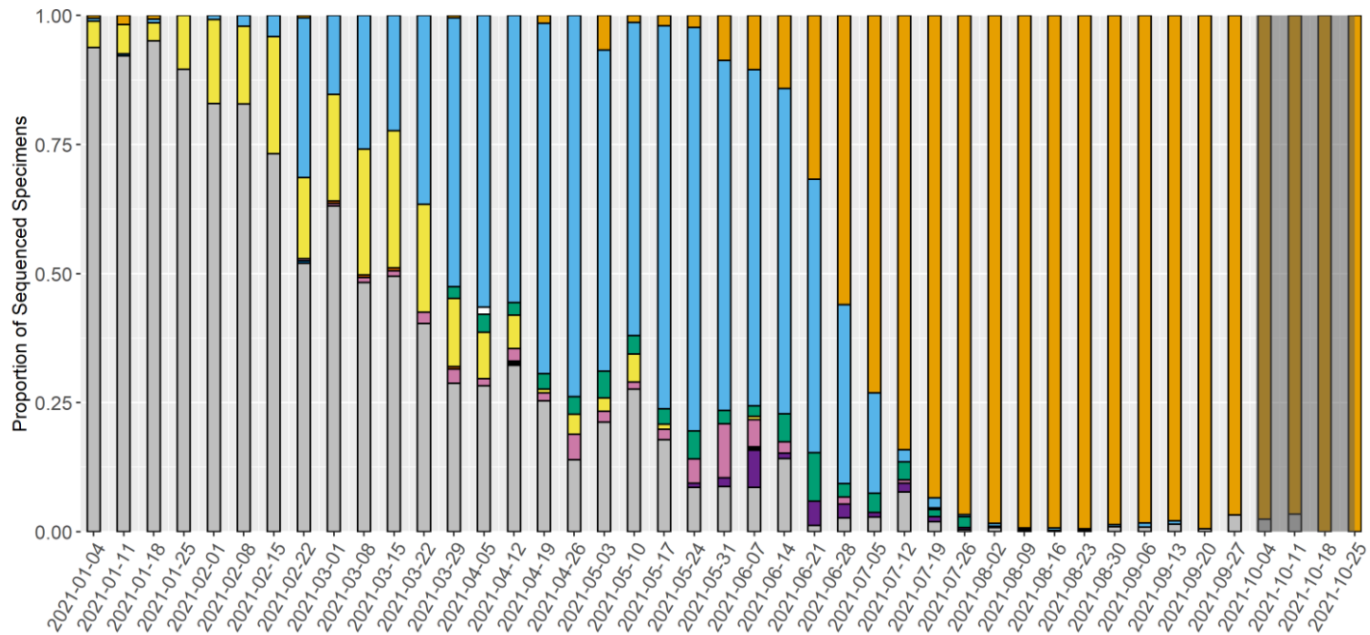
Variant Monitoring: not driving the current rise in cases

<https://www.cdc.gov/covid-data-tracker/#variant-proportions>



- B.1.617.2, “Δ”, ”Delta”, is the “Indian” variant.
- New variants have appeared without evident intermediates.

New Mexico’s data are consistent with Delta being dominant.



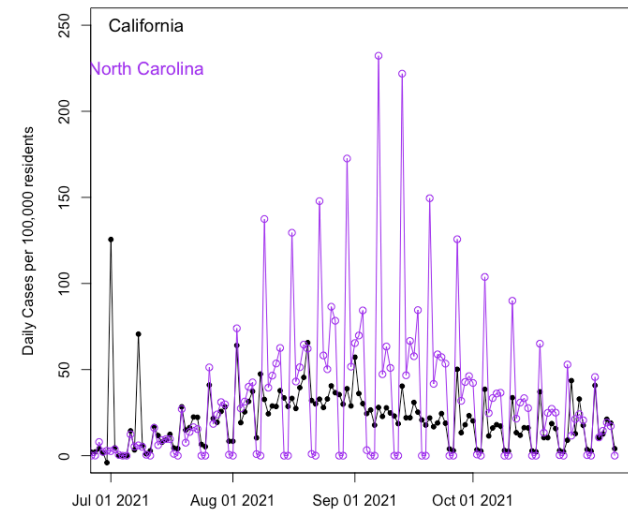
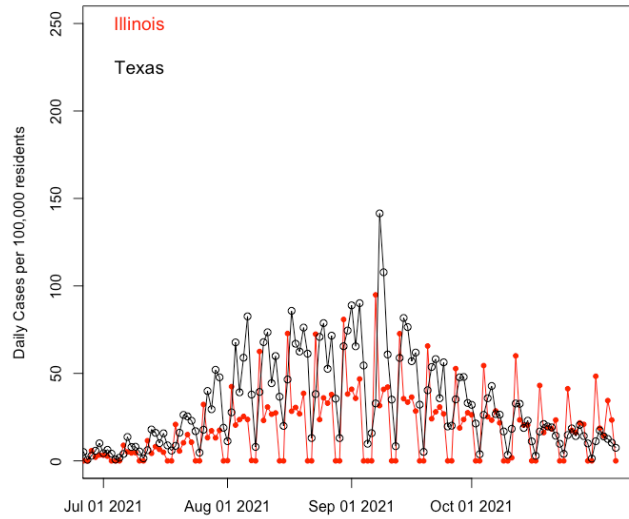
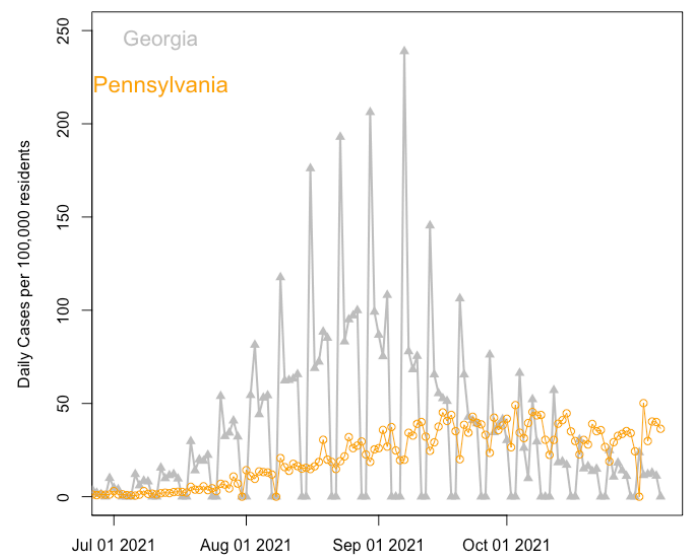
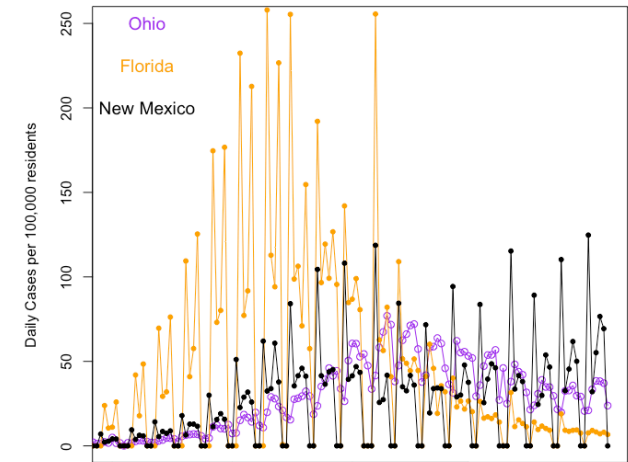
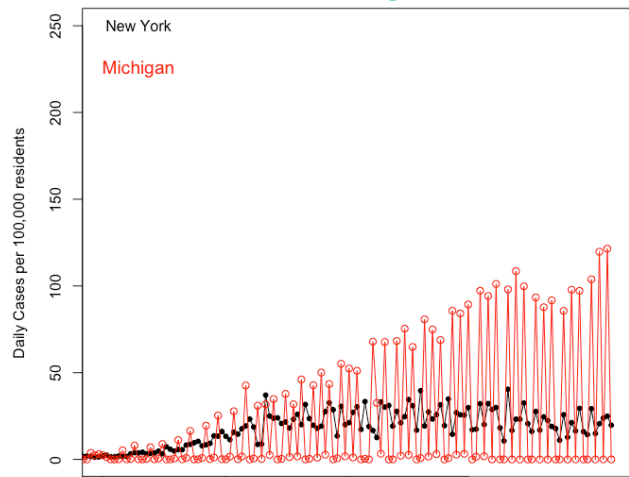
Screen shot of CDC variant data only, no static image available

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

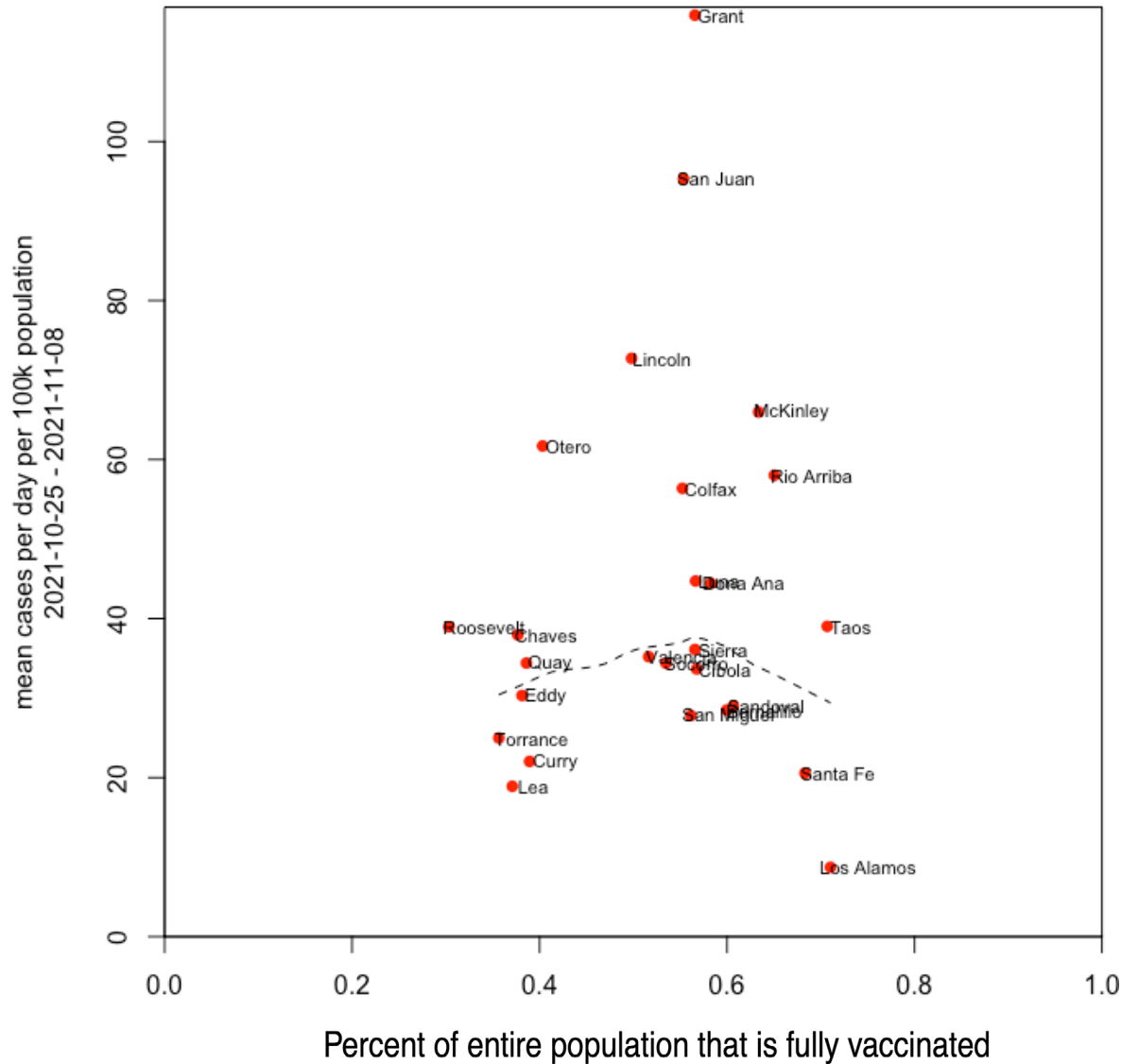
Trends over the last 3 weeks: **Increasing**: New Mexico, Michigan. **Steady**: California, Illinois, Ohio, Pennsylvania, New York. **Modest Declines**: Florida, Georgia, Texas. **Declining**: N. Carolina

	Cases	Deaths
New York	21.08	0.188
Michigan	49.29	0.447
Ohio	30.39	0.659
Florida	6.71	0.432
New Mexico	51.12	0.434
Illinois	19.86	0.241
Texas	10.62	0.37
California	15.82	0.189
North Carolina	15.3	0.262
Georgia	10.2	0.517
Pennsylvania	31.59	0.541

Daily rates per 100,000 residents averaged October 26th thru November 8th 2021.



Cases plotted versus vaccination by county



Recent case load relative to fraction of the entire population vaccinated.

- San Juan, and Grant Counties have very high incidence.
- Colfax, Lincoln, McKinley, Otero, and Rio Arriba Counties are high.
- Dona Ana, and Lea Counties are marginally high.
- Lea, Torrance, and Quay have low incidence compared with immunity.
- Curry, and Lea Counties have low incidence.
- Seven counties are not on this plot due to relative isolation and small populations: Catron, De Baca, Guadalupe, Harding, Hidalgo, Mora and Union.
- **All counties but one have high absolute transmission**, well above 10 per 10⁵ per day over the last two weeks.
- Current levels of vaccination are below level required for an endemic state rather than epidemic.
- Analyze vs. time since of immunization in each county. Waning immunity?