

Modeling & Forecasting COVID-19 in NM

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October 26, 2021

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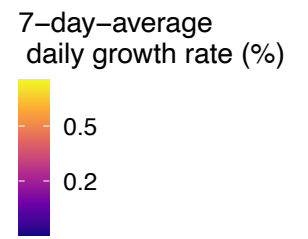
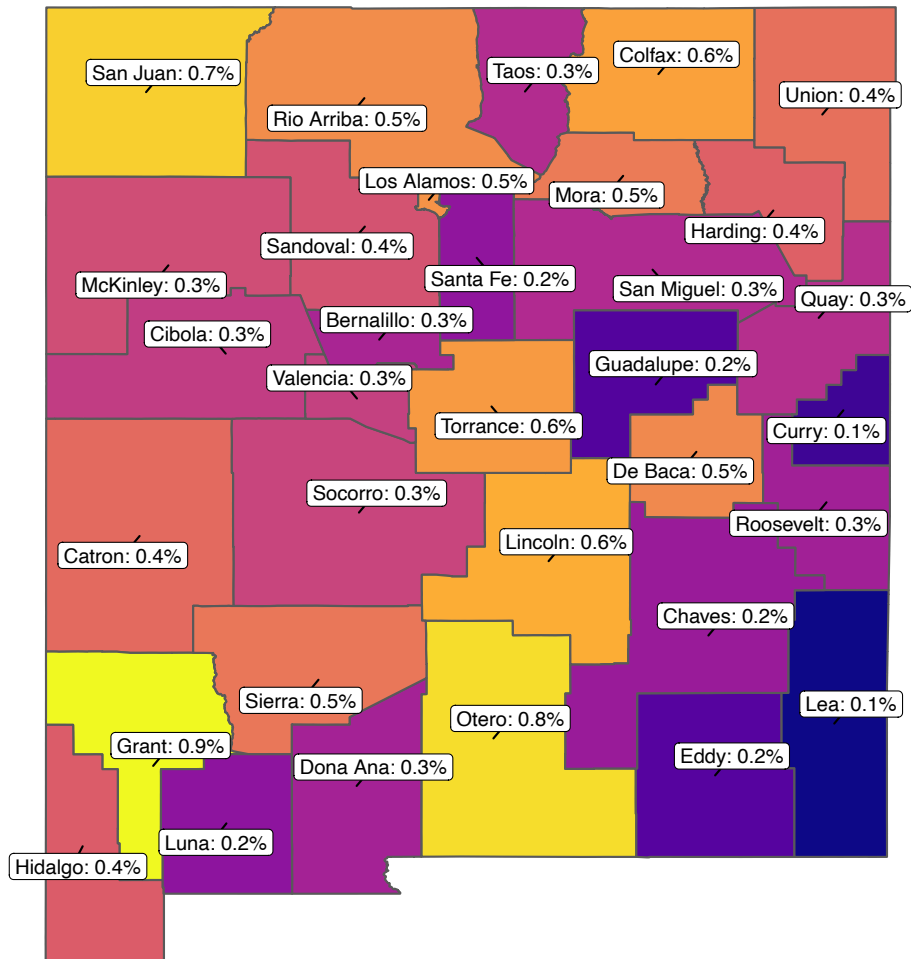
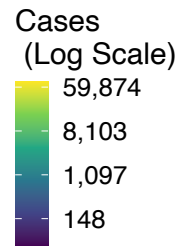
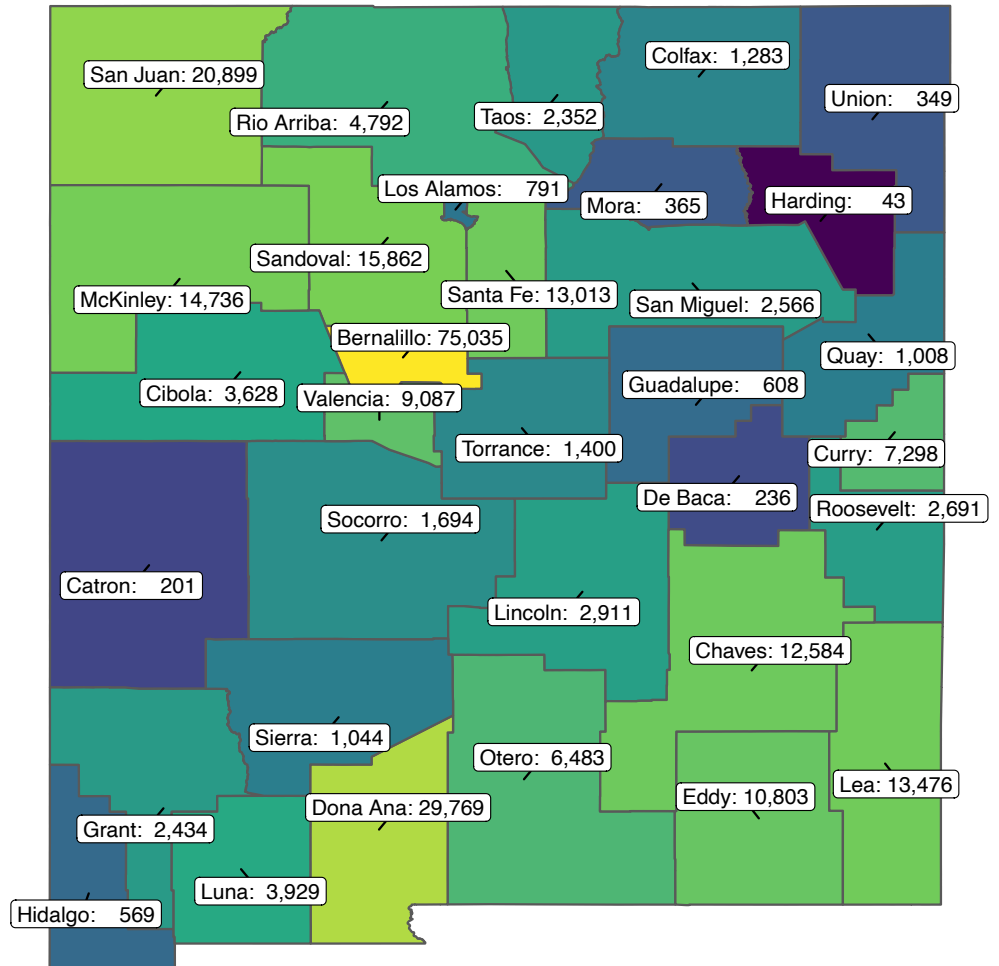
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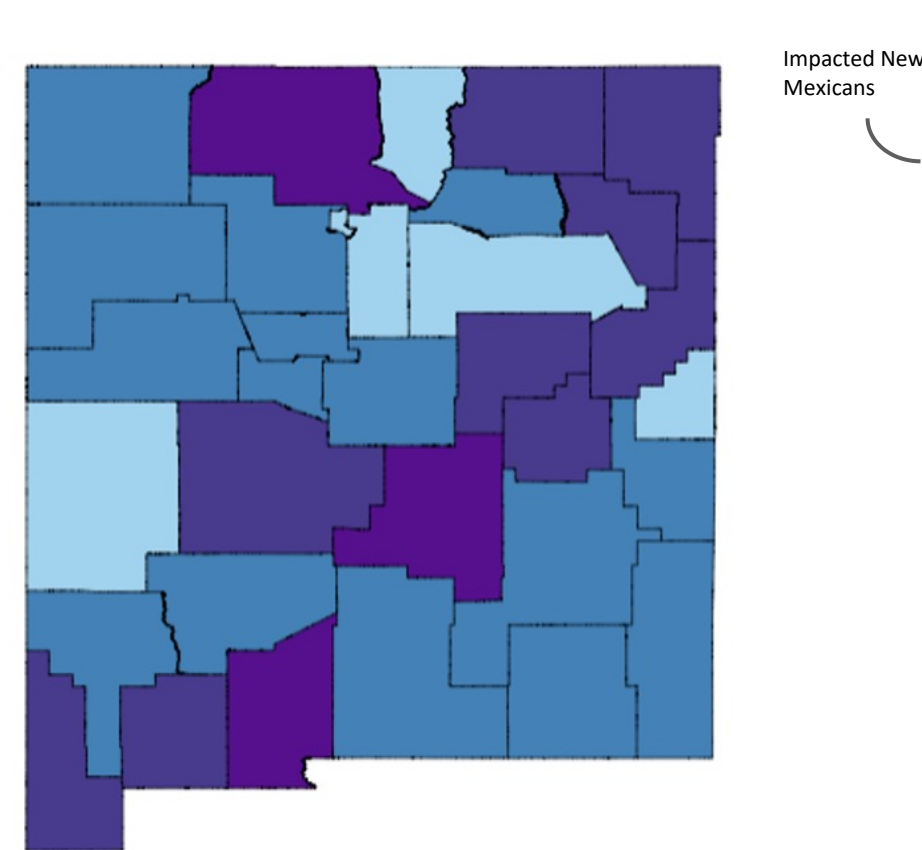
Cumulative Cases & Daily Growth Rate for NM: Oct 25



San Juan, Grant, Otero, Colfax, Lincoln, Torrance have elevated cumulative growth rates

*Growth rate is in cumulative cases

Weekly Growth Rate for NM: Another View (Oct 25)



Counties with New Cases This Week

Growth Rate	Accelerating	0k	0k	274k
	Constant	0k	0k	77k
	Decelerating	0k	282k	1.46M
		Low	Med	High
		Cases Per Capita		

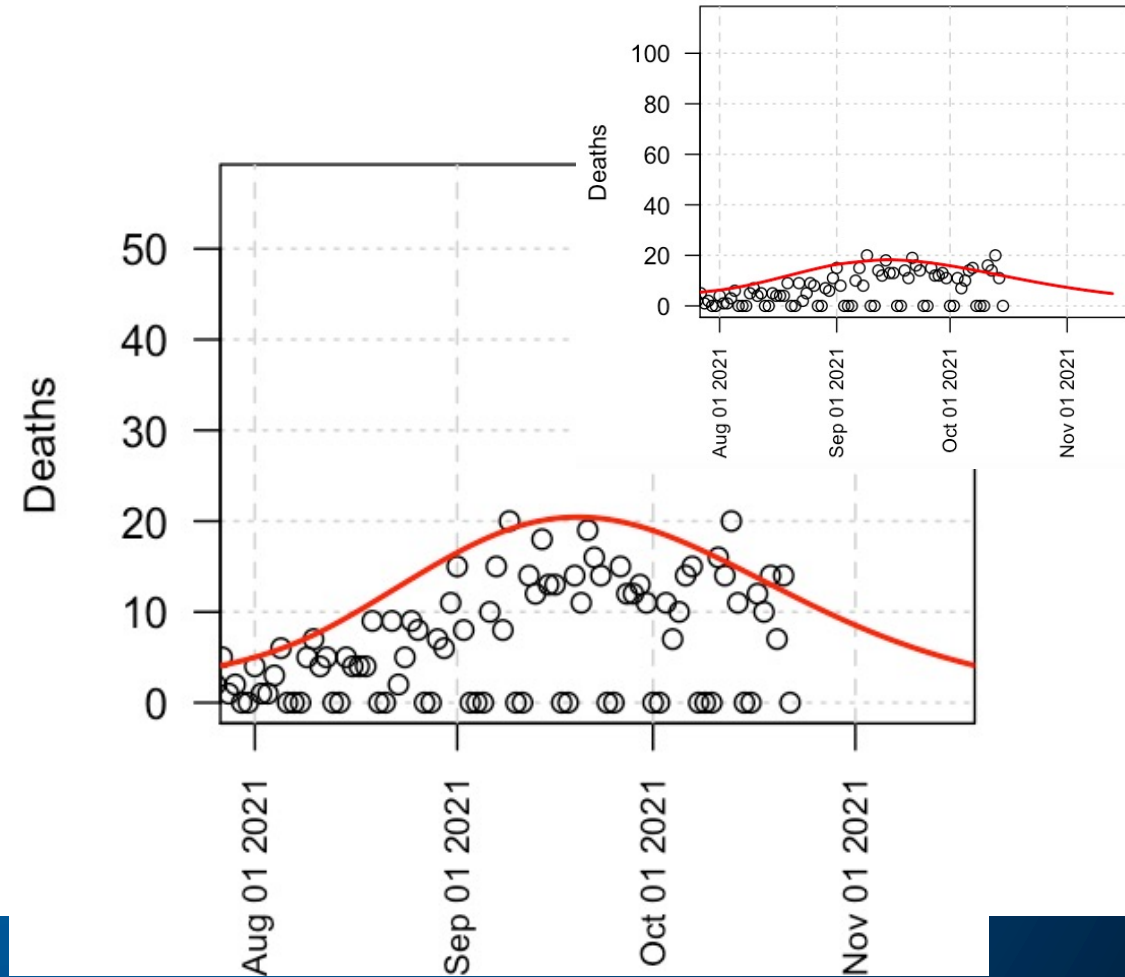
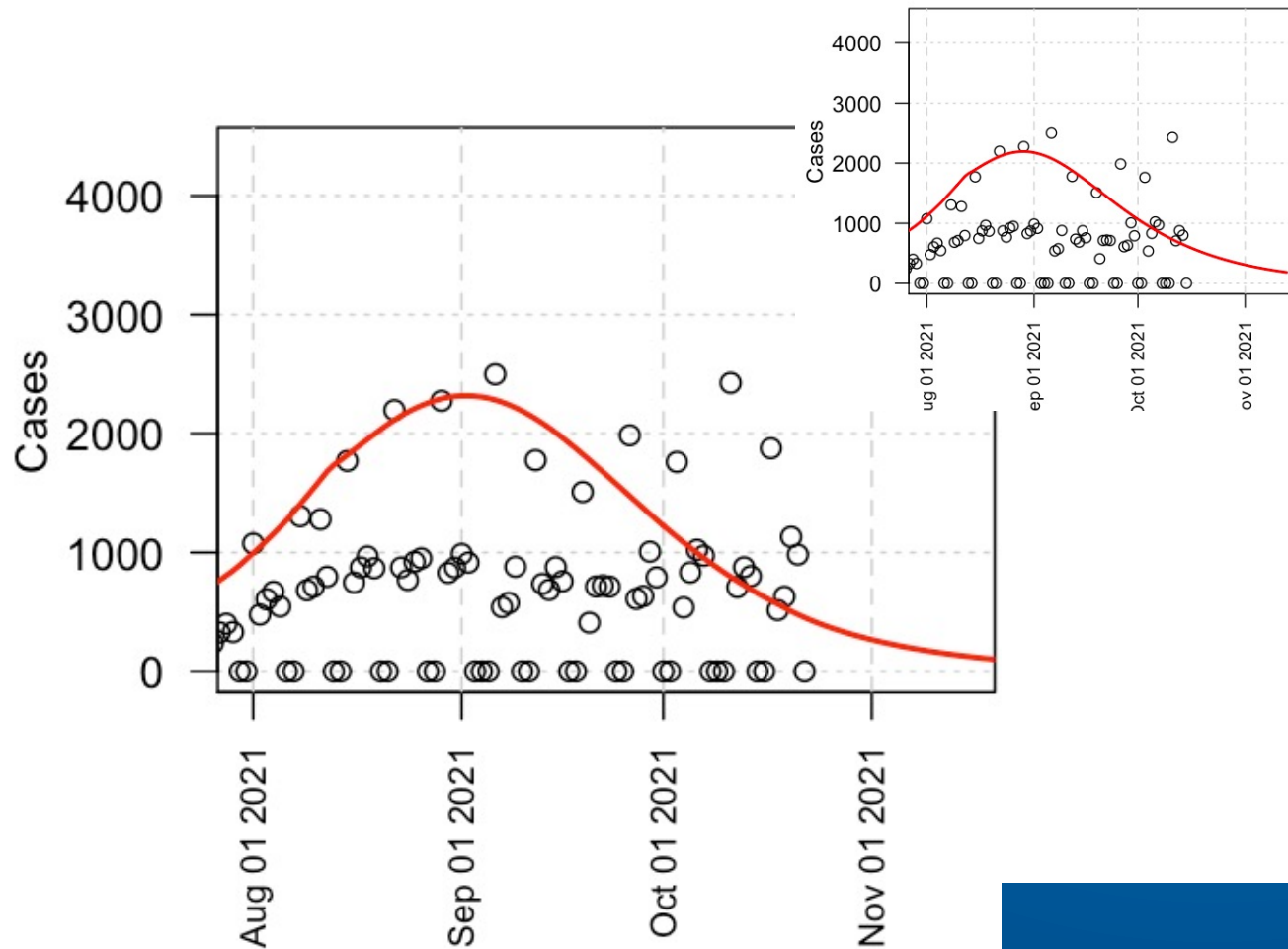
- ## So what?
- Rio Arriba, Dona Ana, and Lincoln are accelerating
 - San Juan, Rio Arriba, Otero, McKinley, Lincoln, Grant, DeBaca have higher per-capita case counts
 - Most people in New Mexico are living in a county that is **high per-capita case counts and decelerating**

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

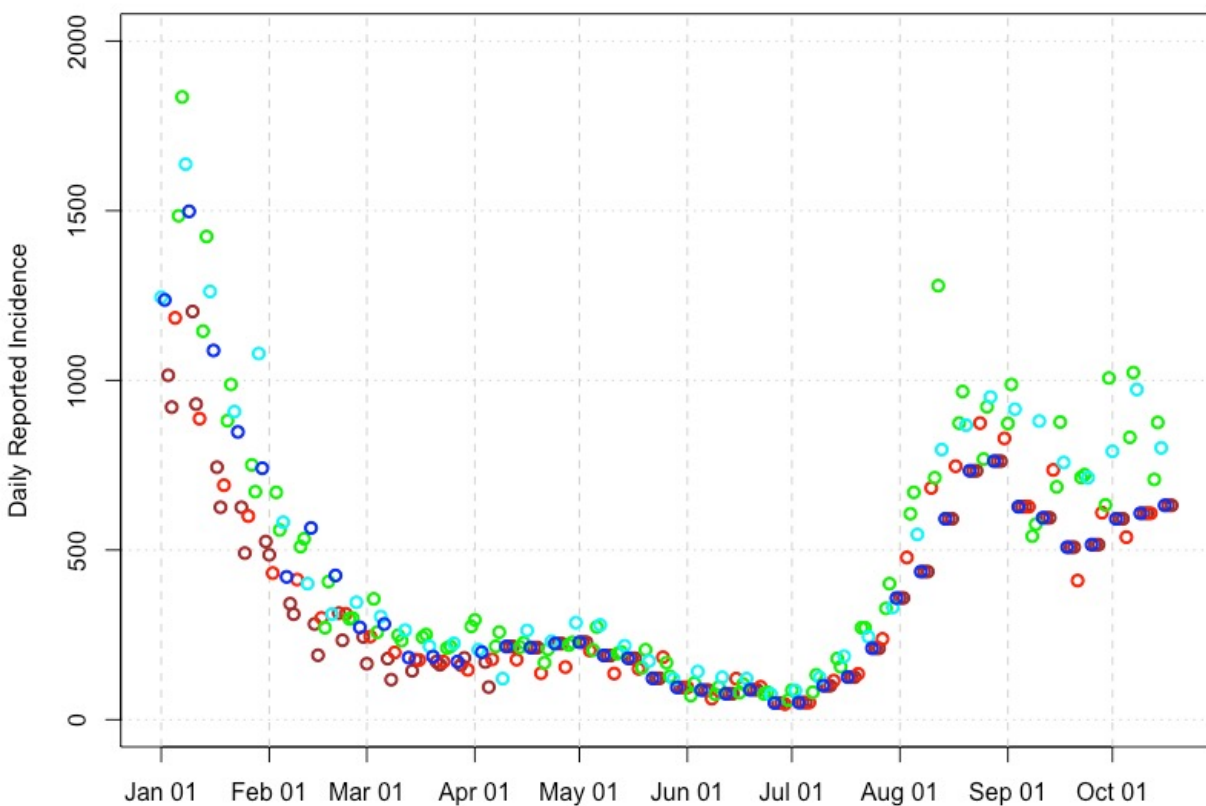
26 Oct 2021: EpiGrid modeling

- This model is too optimistic. New Mexico has a net rising incidence rate. Hospitalization data support this.
- The fraction of individuals who isolate may be deteriorating (not timeliness to isolation). This may be partly causative.
- NM daily deaths show a peak in mid- to late-September. A transient increase in mortality is possible.
- Further youth vaccination for ages 5+ after 26 October is likely to improve the overall incidence.



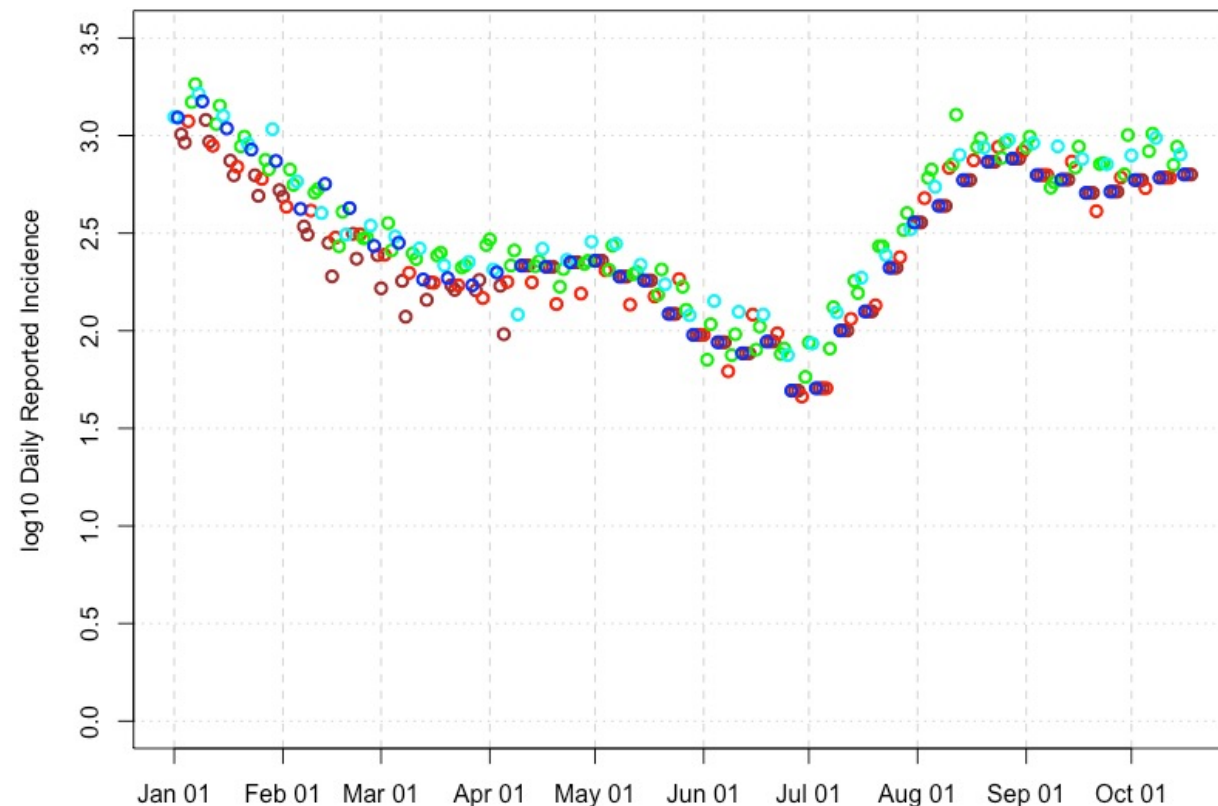
A look at the raw incidence data

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



Reported cases rates are rising.

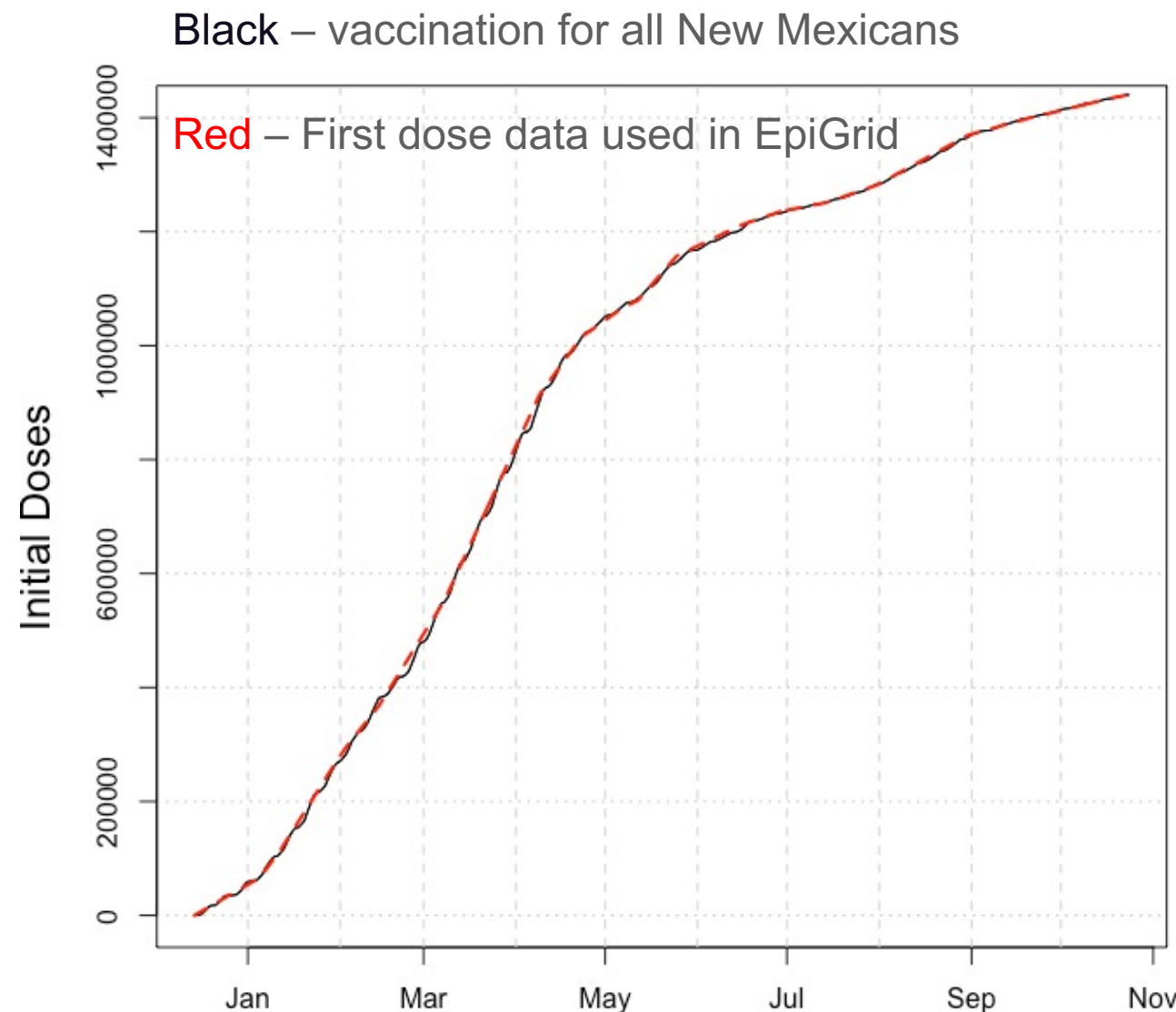
The 190 cases in the Lea county correctional facility are removed from data reported on March 26th. The 1/3 of reported cases that were > 2 weeks prior were removed from March 24th. Case reported for weekends starting April 10-12th are each divided by 3 to estimate individual day counts.



26 October 2021 Vaccine Analysis

- 1440k first doses are used in modeling.
- ~1434k first doses have been administered in NM.
- ~1265k completed vaccine series in NM.
- ~68.4% of all persons in New Mexico are at least minimally vaccinated.
- ~85.5% of all persons in New Mexico are currently eligible (~1792k).
- 68.0/85.5 ~ 80.0% of all eligible people are vaccinated.
- 5-11 year-old vaccinations are possible this week.

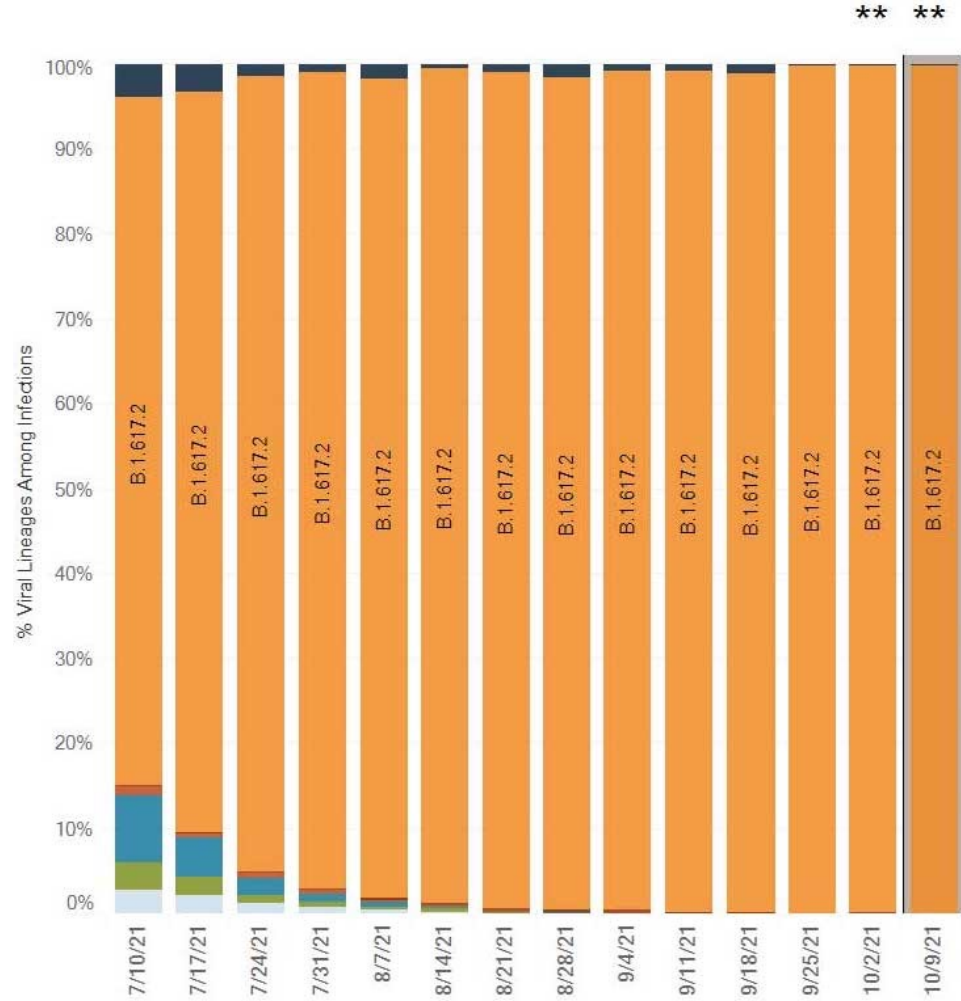
- A simple calculation of effective reproductive number for Delta variant with $> \sim 75\%$ immune suggests “intrinsic” $Re \sim 2$.
- An effective reproductive number near 1 based solely on vaccination will not be achieved until $> \sim 80\%$ vaccination of the total population.
- High adoption of third/months-spaced doses in vulnerable populations will lower mortality, hospitalization.



US Census Bureau reports 2097k people in New Mexico.

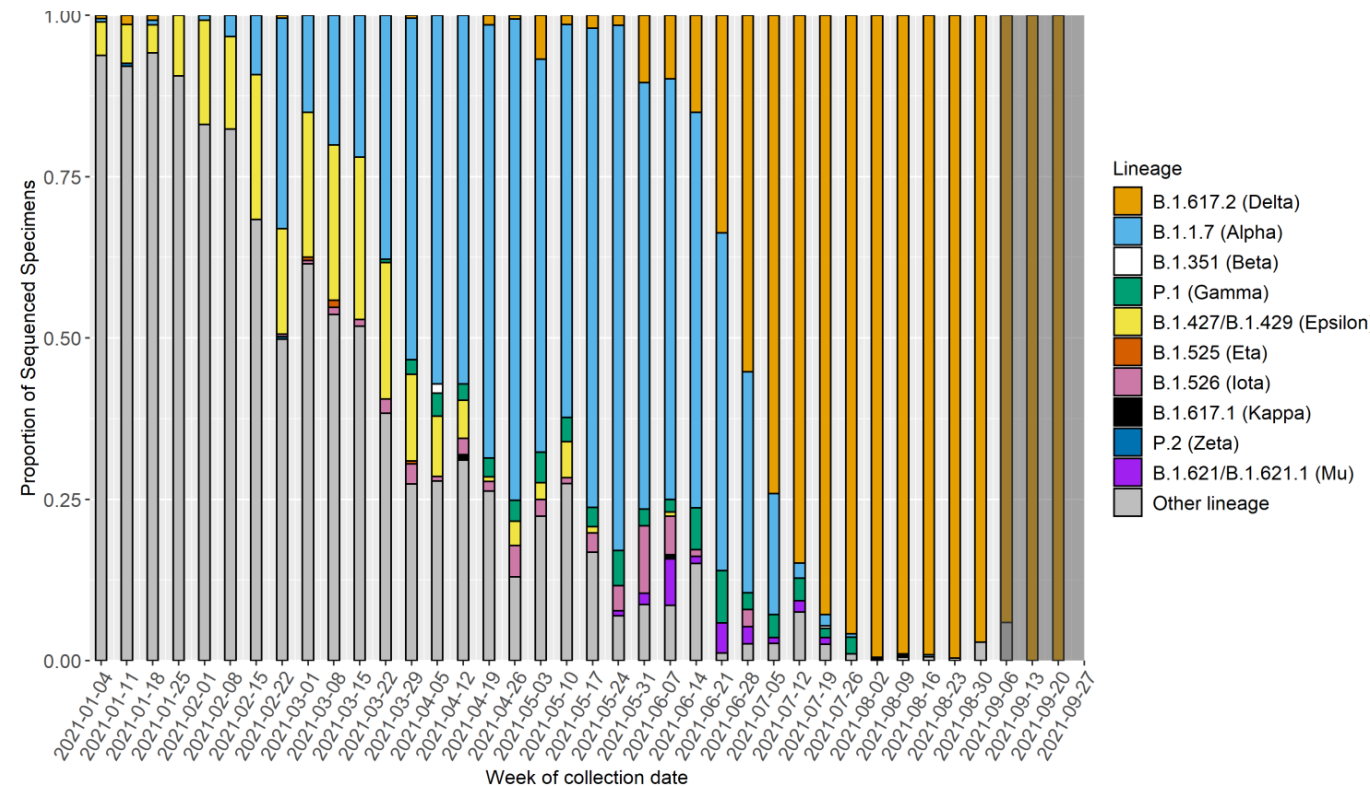
Variant Monitoring

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



- 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.



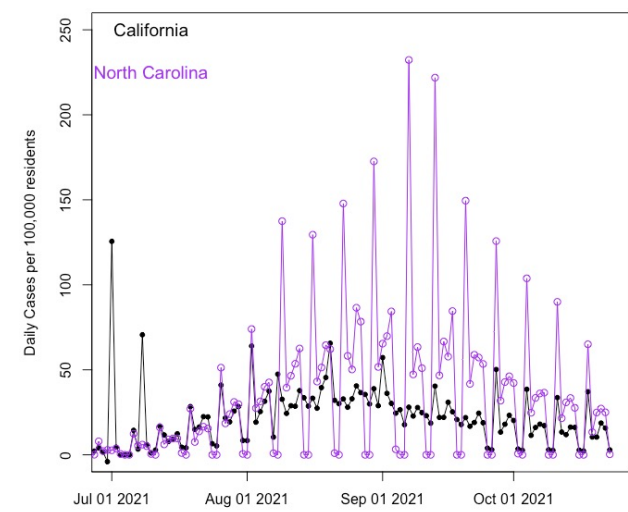
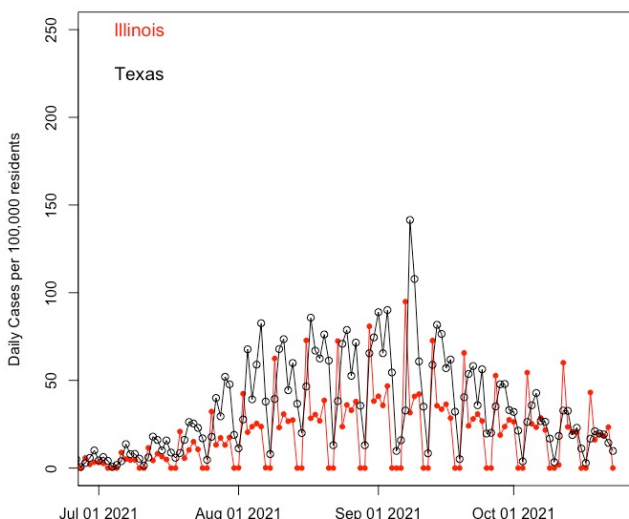
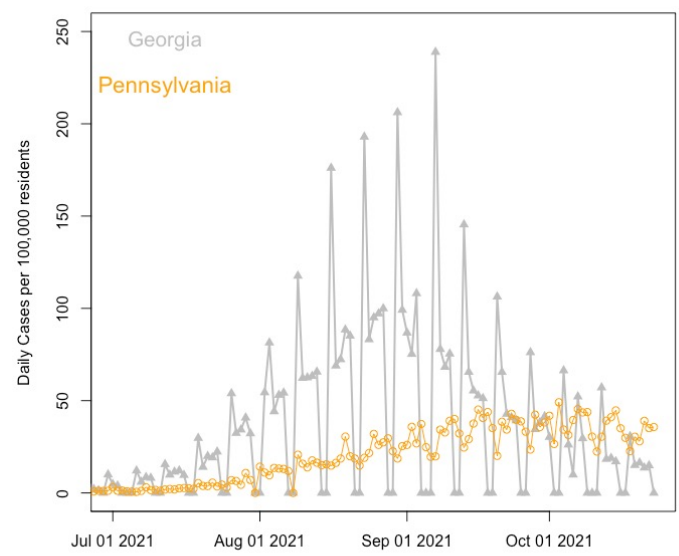
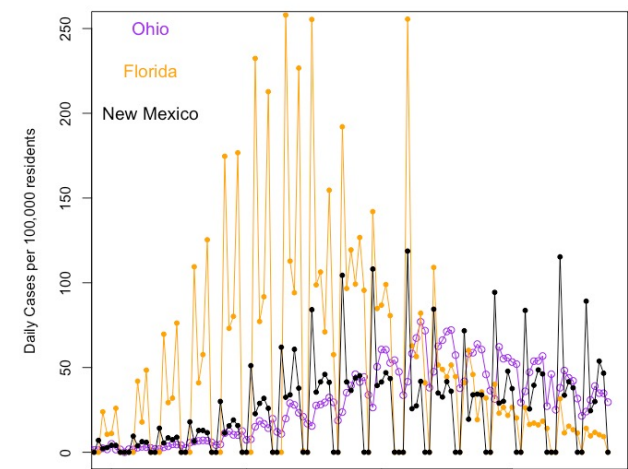
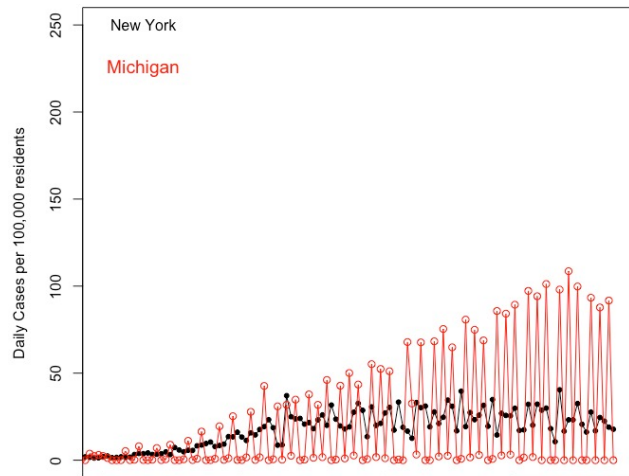
Screen shot of CDC variant data only, no static image available

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:** . **Steady:** California, New Mexico(?), Pennsylvania, New York. **Modest Declines:** Illinois, N. Carolina, Michigan, Texas. **Declining:** Florida(*), Georgia, Ohio,

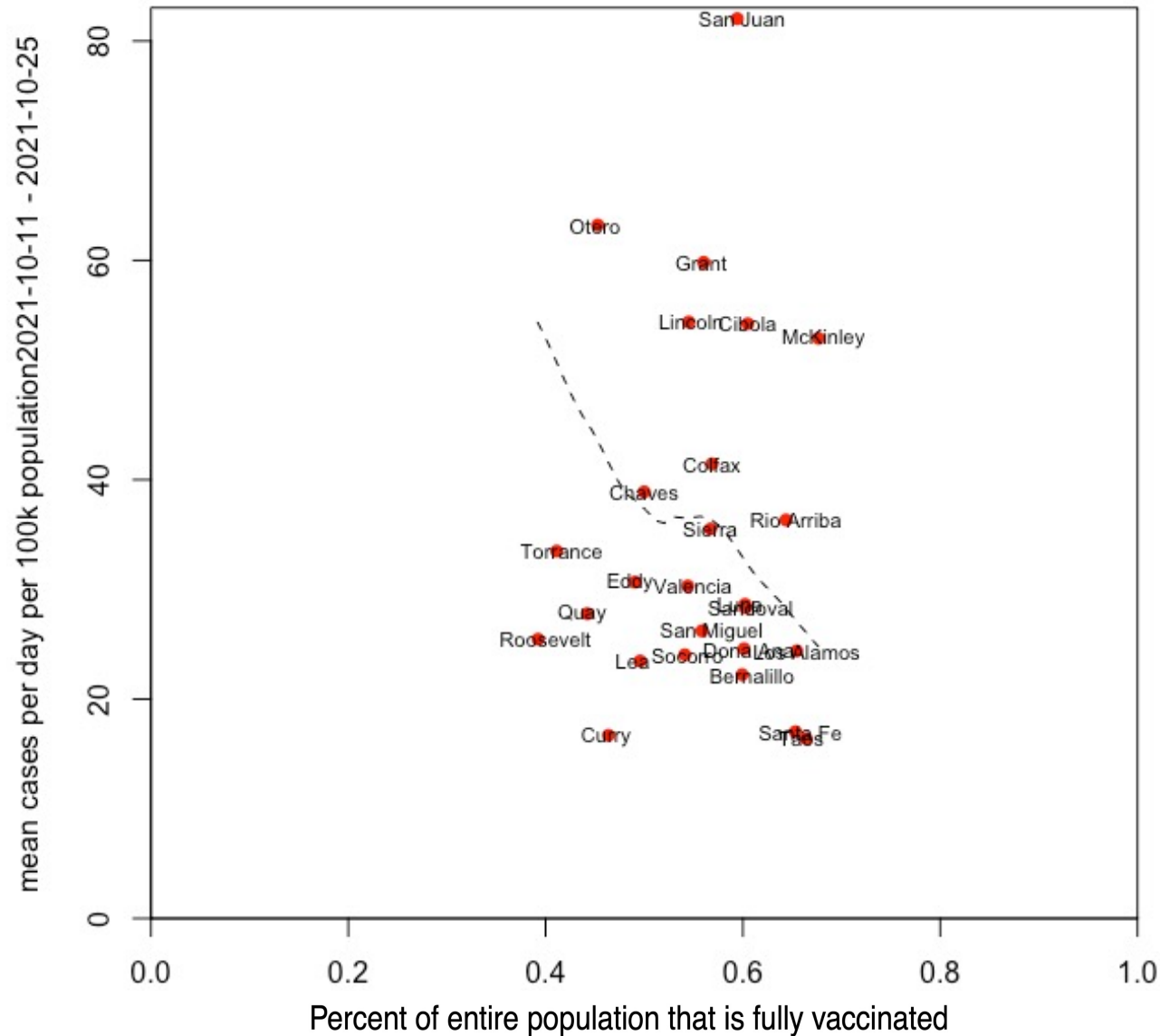
	Cases	Deaths
New York	20.62	0.182
Michigan	38.97	0.483
Ohio	30.66	0.766
Florida	7.86	0.615
New Mexico	34.86	0.387
Illinois	17.14	0.247
Texas	14.81	0.604
California	13.95	0.266
North Carolina	22.25	0.415
Georgia	12.95	0.926
Pennsylvania	31.54	0.609

Daily rates per 100,000 residents averaged October 18th thru October 25th 2021.



* The suggestion has been made that cooler weather leads to people outside.

Cases plotted versus immunity by county



Infection control *relative to immunity*.

- San Juan County has very high incidence.
- Cibola, Grant, Lincoln, McKinley Counties are high.
- Colfax, Otero, and Rio Arriba Counties are marginally high.
- Lea, Torrance, and Quay have low incidence compared with immunity.
- Roosevelt and Curry have surprisingly 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 have high absolute transmission**, well above 10 per 10^5 per day over the last two weeks.
- Current levels of immunity are well below level required for an endemic state rather than epidemic.
- This analysis is illustrative of and testing for sensitivities. We will likely return to vaccination-only analysis next week.

Recent by-county *trends* in daily incidence (are things getting better? **No.**)

- Trends, meaning time-dependence, not magnitude
- Per capita normalization not needed here (trends, not magnitude)
- Not referenced to vaccination rates (see the previous slide)
- Not referenced to whether the situation is currently intermediate, bad, or really bad. Barely reaching good anywhere in the USA.
- **Counties with falling incidence:**
- **Counties with slowly falling incidence:** Chaves, Curry, Eddy, Torrance.
- **Counties with steady incidence:** Catron, Cibola, Colfax, De Baca, Guadalupe, Harding, Hidalgo, Lea, Lincoln, Los Alamos, Luna, McKinley, Mora, Quay, Roosevelt, Sandoval, San Miguel, Santa Fe, Sierra, Union, Valencia.
- **Counties with rising incidence:** Bernalillo, Dona Ana, Grant, Otero, Rio Arriba, **San Juan**, Socorro, Taos.

Statewide by-county incidence trends are heterogeneous, with no areas of good control, some counties with poor control, and many in an unstable intermediate range. Bernalillo's recent trend is somewhat concerning.

Need a population-wide understanding of what makes good infection control. The Delta variant is more contagious. As people move inside for the winter, indoor infection control is crucial, and needs to be more stringent than last winter.