

# Modeling & Forecasting COVID-19 in NM

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April 19, 2022

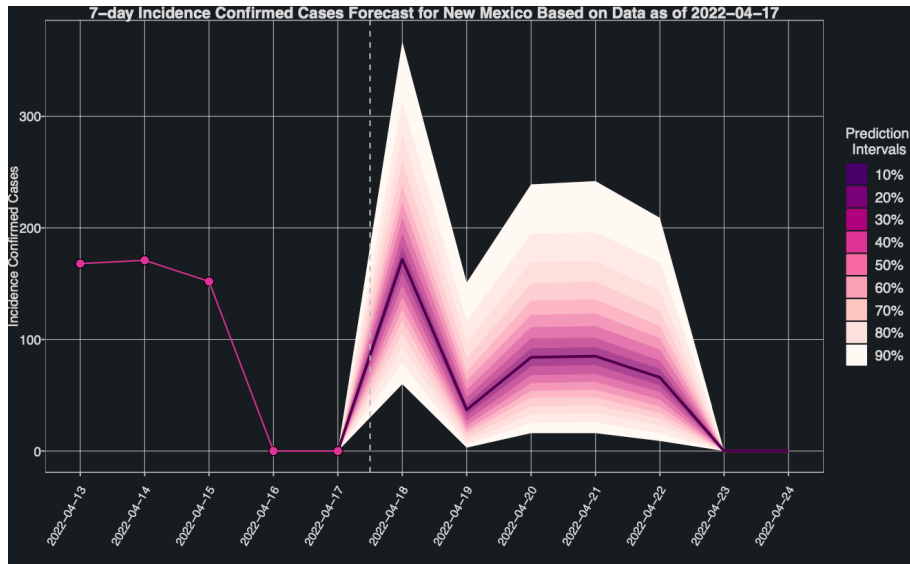
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# Short- & Long-Term Forecast for NM: Cases



**6-Week Forecast of Confirmed Cases for New Mexico Based on Data as of 2022-04-17**

Week	Best Case (5th Percentile)	Middle Case (50th Percentile)	Worst Case (95th Percentile)
2022-04-17		519,833*	
2022-04-24	519,938	520,279	521,048
2022-05-01	520,064	520,808	522,438
2022-05-08	520,208	521,414	524,060
2022-05-15	520,381	522,104	525,799
2022-05-22	520,557	522,860	527,716
2022-05-29	520,724	523,703	529,902

\*Last reported confirmed cases count



**6-Week Forecast of Daily Average of Confirmed Cases for New Mexico Based on Data as of 2022-04-17**

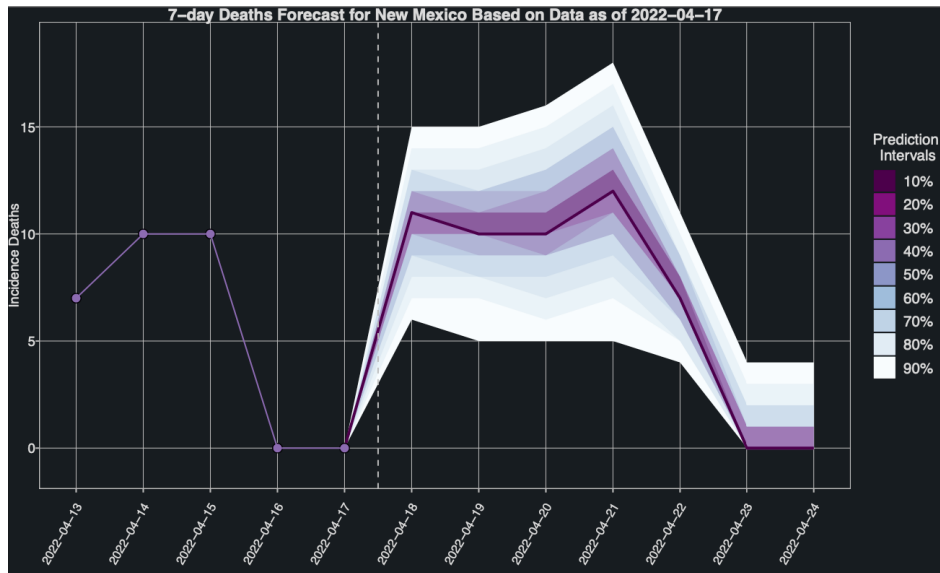
Week End Date	Best Case (5th Percentile)	Middle Case (50th Percentile)	Worst Case (95th Percentile)
2022-04-17		127*	
2022-04-24	15	63	173
2022-05-01	17	75	203
2022-05-08	19	86	230
2022-05-15	21	98	260
2022-05-22	21	108	299
2022-05-29	19	117	342

\*Last reported confirmed cases count

**So what?**

**Our model suggests that the number of daily cases is expected to range between 15 and 350 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 2022-04-17**

Week	Best Case (5th Percentile)	Middle Case (50th Percentile)	Worst Case (95th Percentile)
2022-04-17		7,410*	
2022-04-24	7,436	7,463	7,484
2022-05-01	7,459	7,514	7,560
2022-05-08	7,481	7,565	7,641
2022-05-15	7,502	7,618	7,734
2022-05-22	7,523	7,675	7,850
2022-05-29	7,545	7,737	7,997

\*Last reported deaths count



**6-Week Forecast of Daily Average of Deaths for New Mexico Based on Data as of 2022-04-17**

Week Start Date	Best Case (5th Percentile)	Middle Case (50th Percentile)	Worst Case (95th Percentile)
2022-04-17		7*	
2022-04-24	4	7	12
2022-05-01	3	7	12
2022-05-08	3	7	13
2022-05-15	3	7	15
2022-05-22	3	8	18
2022-05-29	2	8	23

\*Last reported confirmed deaths

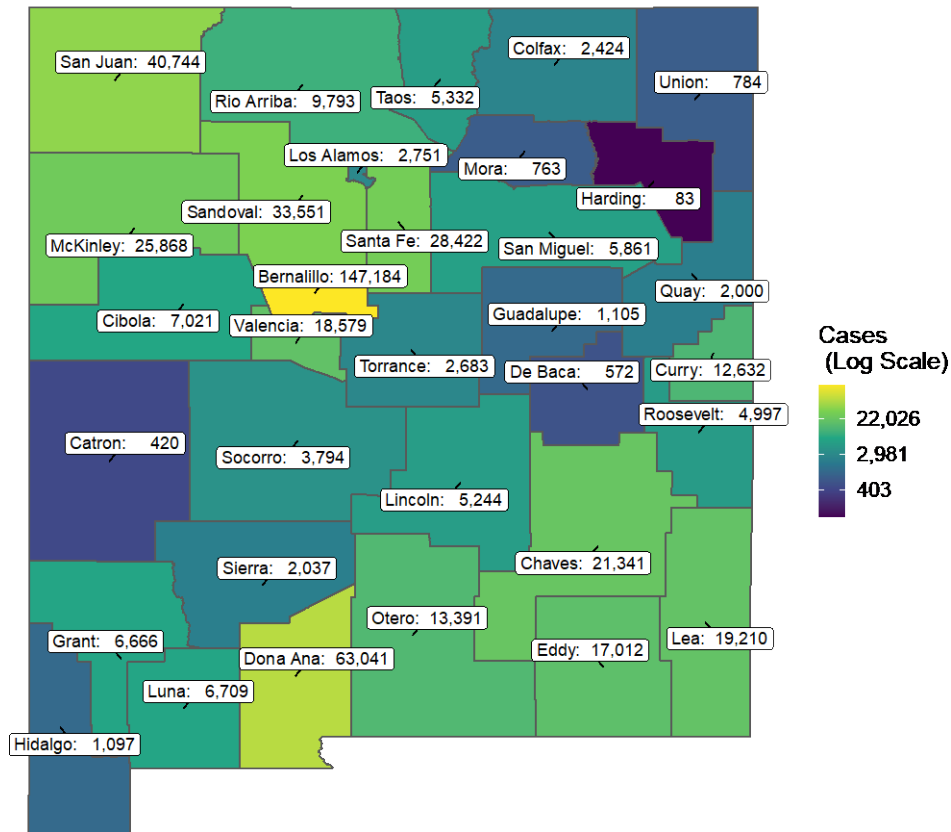
**So what?**

**Our model suggests that the number of daily deaths is expected to range between 2 and 25 in the next few weeks**

# Cumulative Cases & Daily Growth Rate for NM: Apr 18

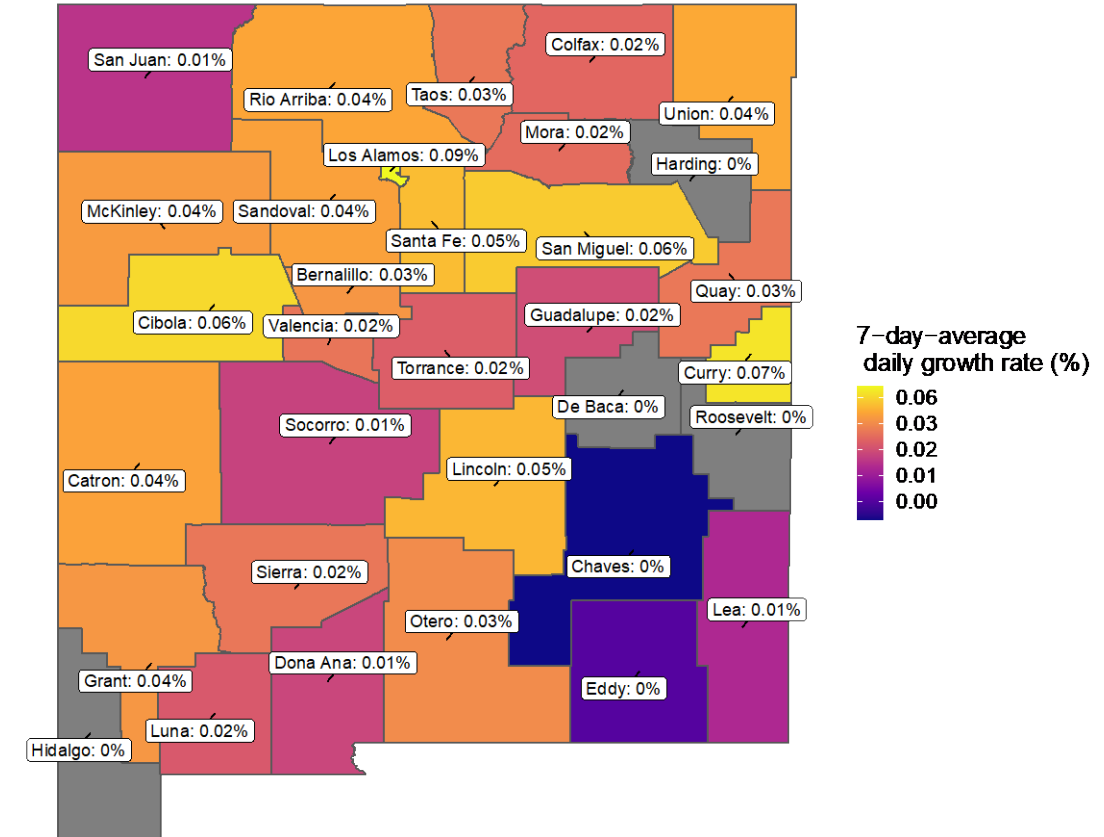
## Cumulative Cases: 2022-04-17

Data Source: JHU <https://github.com/CSSEGISandData/COVID-19>



## County COVID-19 Weekly Growth Rate

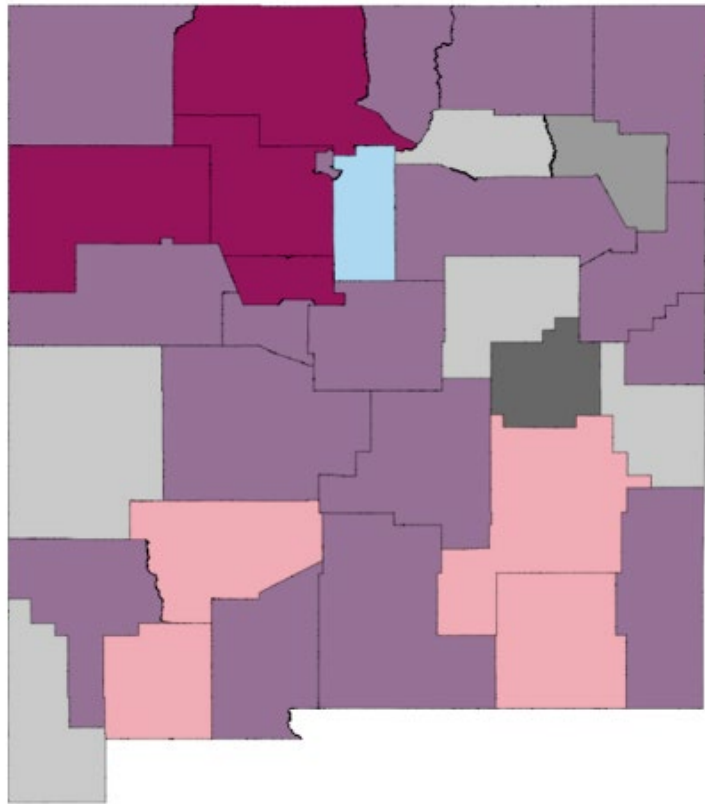
Data Source: JHU <https://github.com/CSSEGISandData/COVID-19>



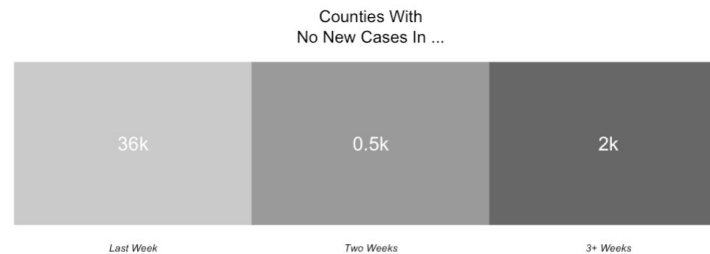
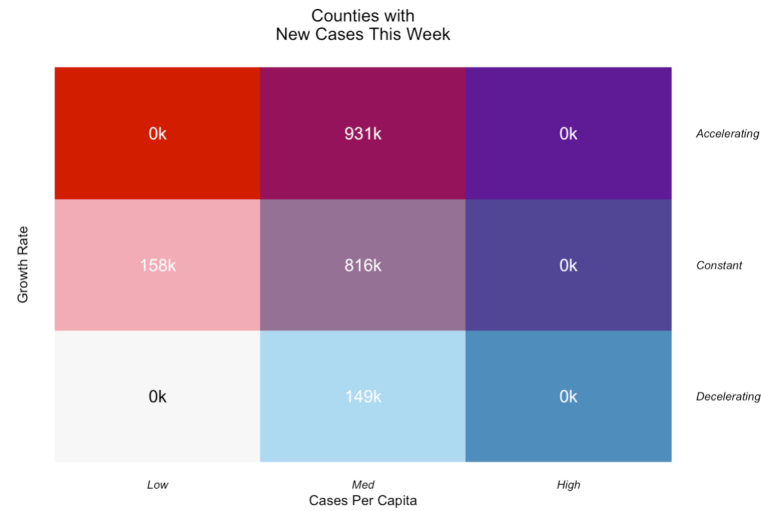
Los Alamos, Cibola, and Curry counties have the highest cumulative growth rates.

\*Growth rate is in cumulative cases

# Weekly Growth Rate for NM: Another View (Apr 18)



Impacted New Mexicans



**So what?**

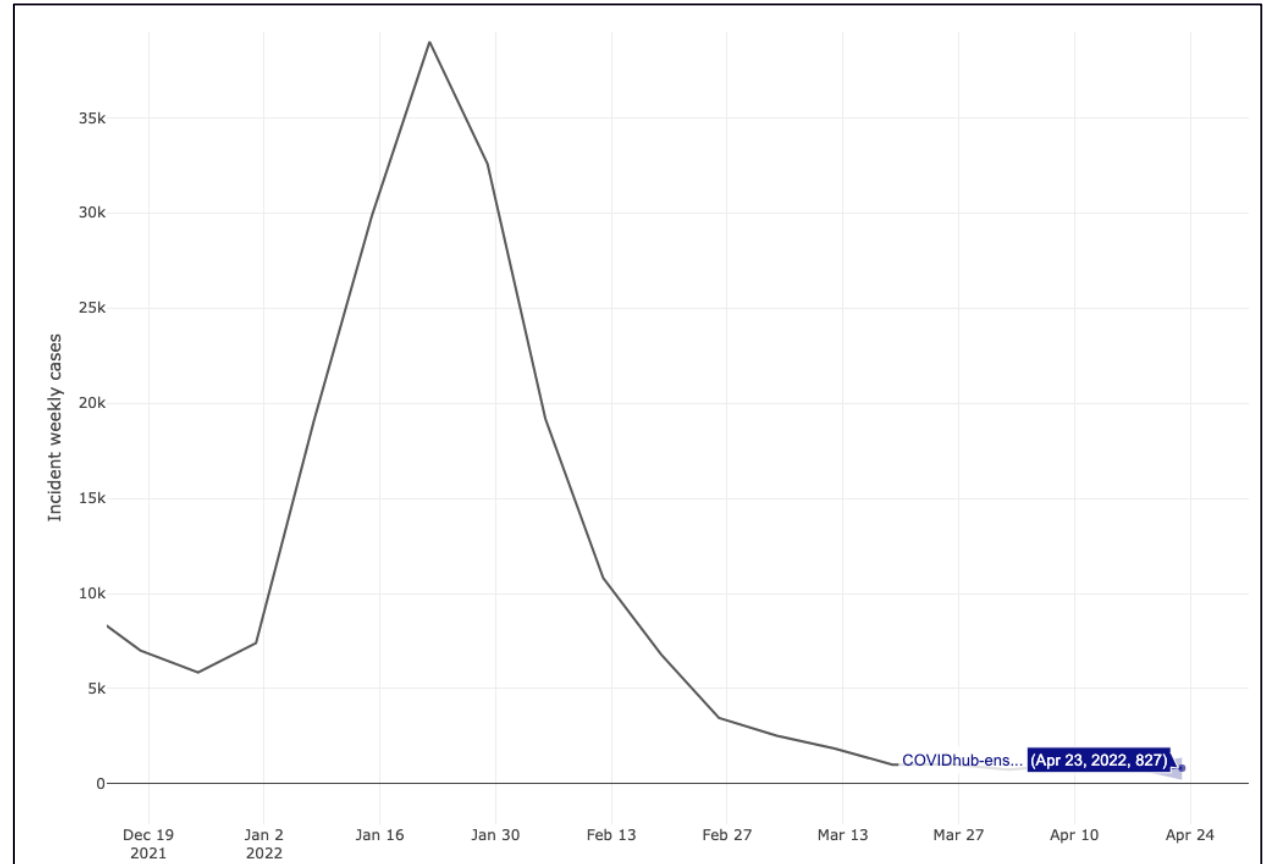
- Most people in New Mexico are living in a county that has **medium per-capita case counts and accelerating**

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 is predicting a 7% decrease in one week incident cases to 827 (from April 16 at 892)

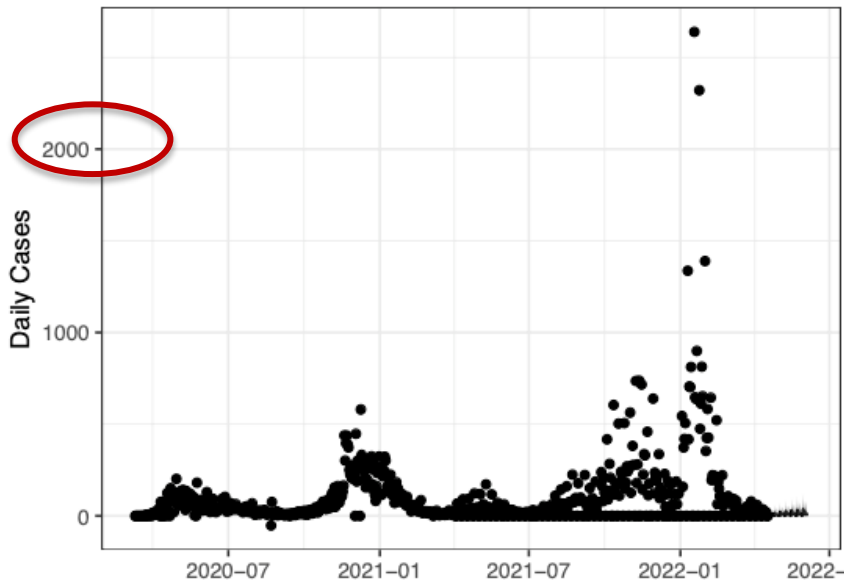


COVIDhub-4\_week\_ensemble prediction, COVID 19 ForecastHub  
<https://viz.covid19forecasthub.org/>

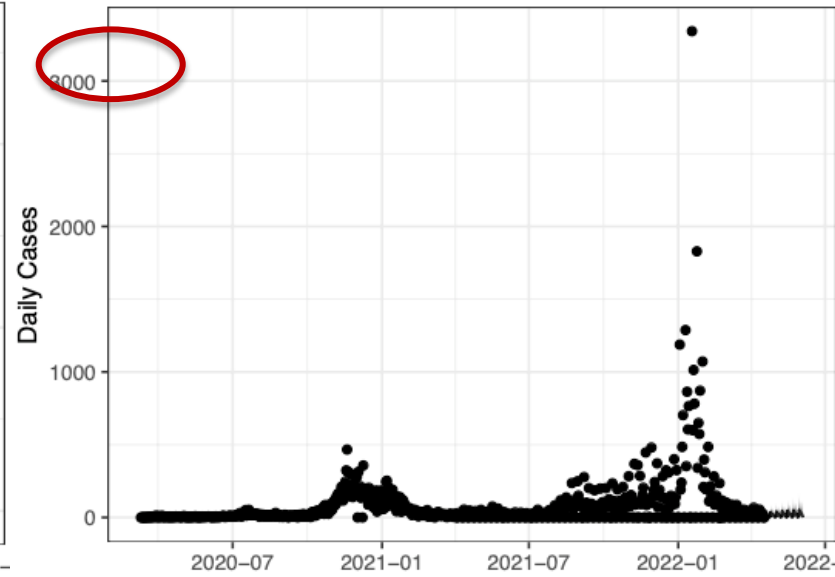
## > **Additional Regional Forecasts**

# Central & North Regions Daily Cases Forecast

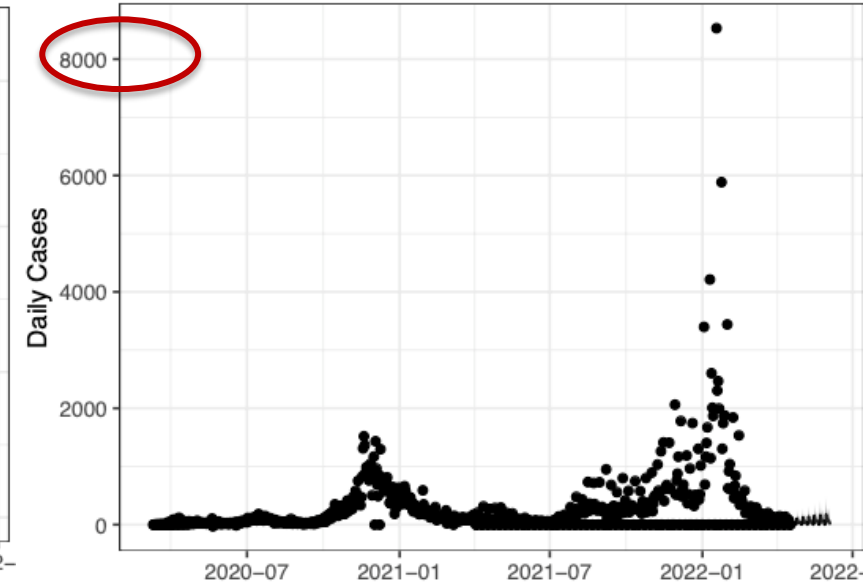
## Northwest



## Northeast



## Central



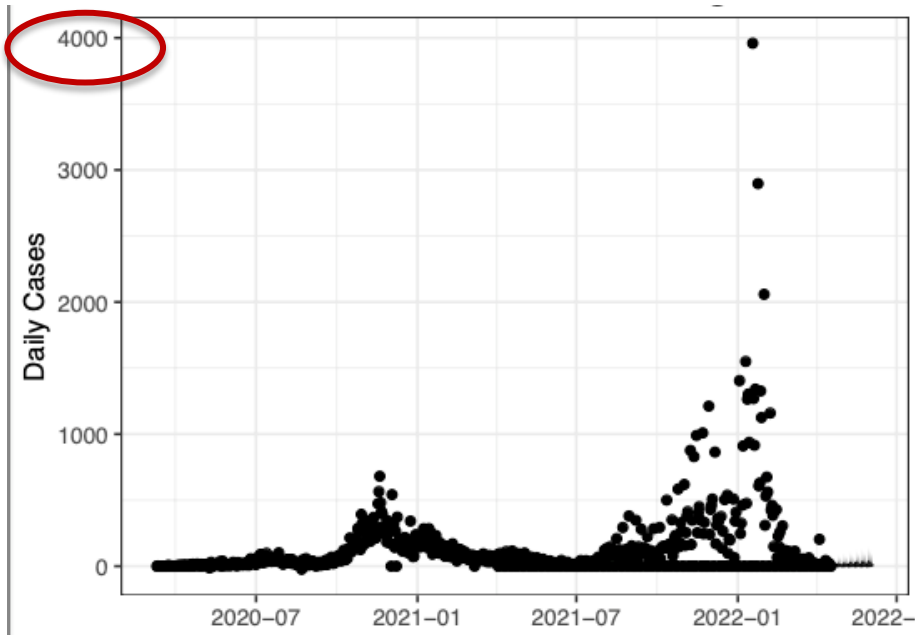
**So what?**

**The Central region is expected to see the most number of cases.  
Cases appear to be plateauing.**

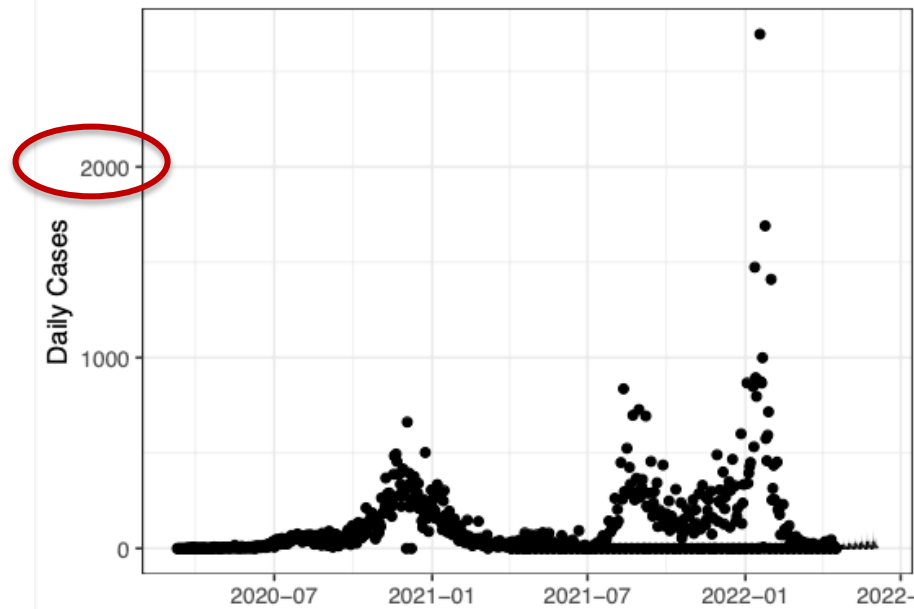


# South Regions Daily Cases Forecast

## Southwest



## Southeast

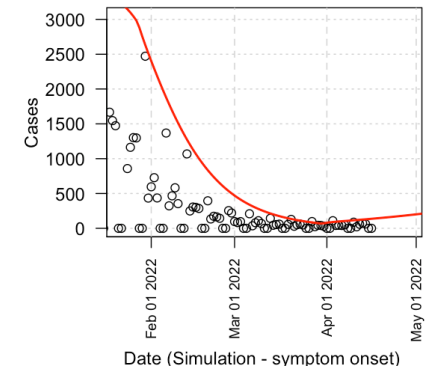


**So what?**

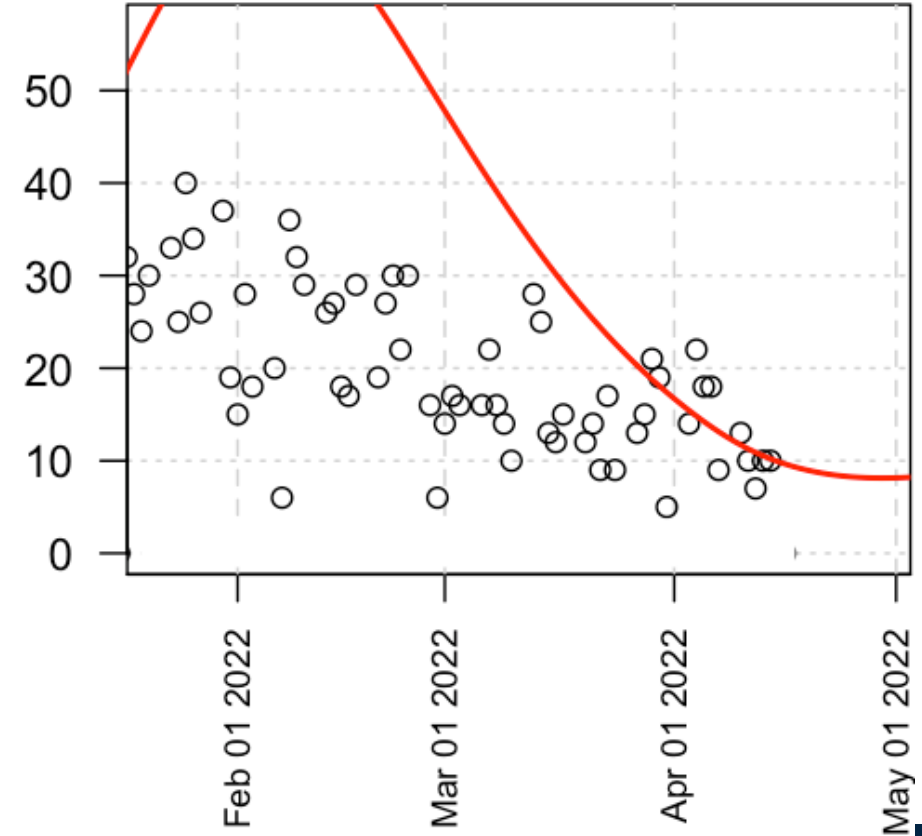
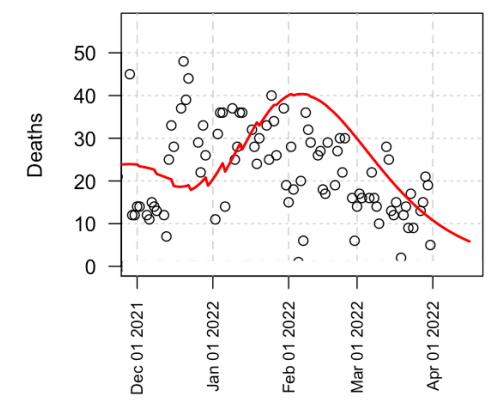
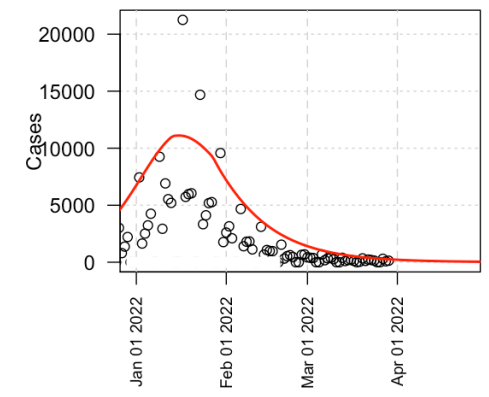
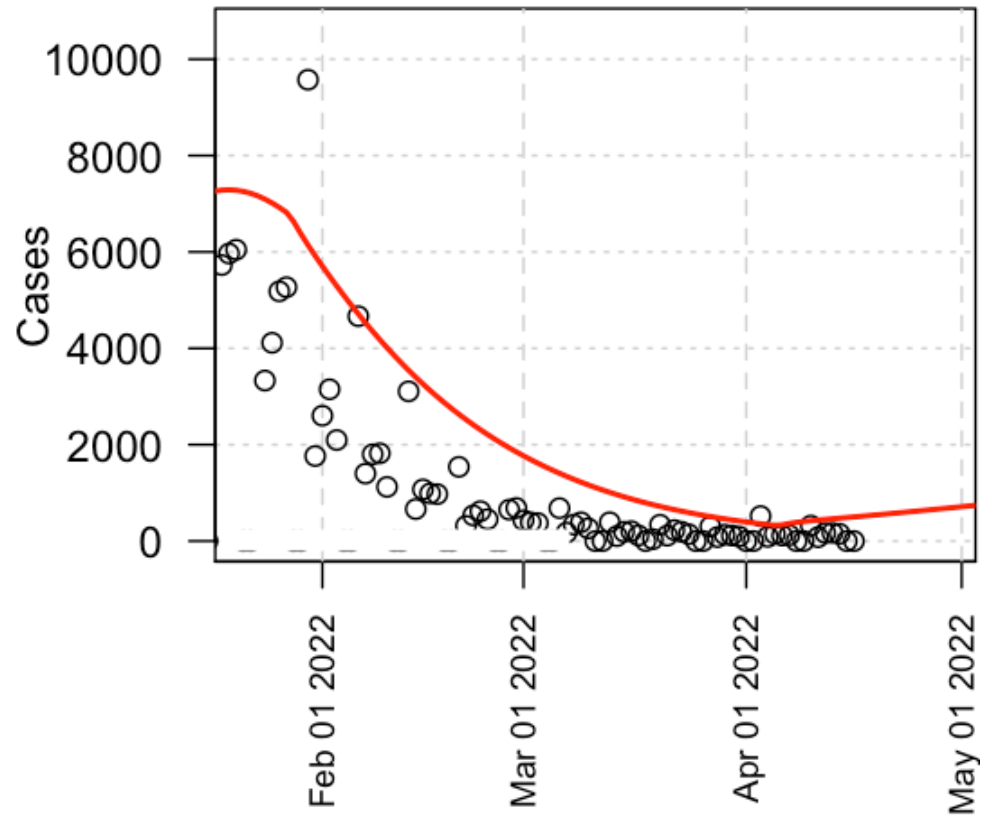
**Both regions have a predicted plateau. The Southwest region is expected to see higher number of cases.**

# 19 Apr 2022: Epigrad modeling

New Mexico\_\_Bernalillo



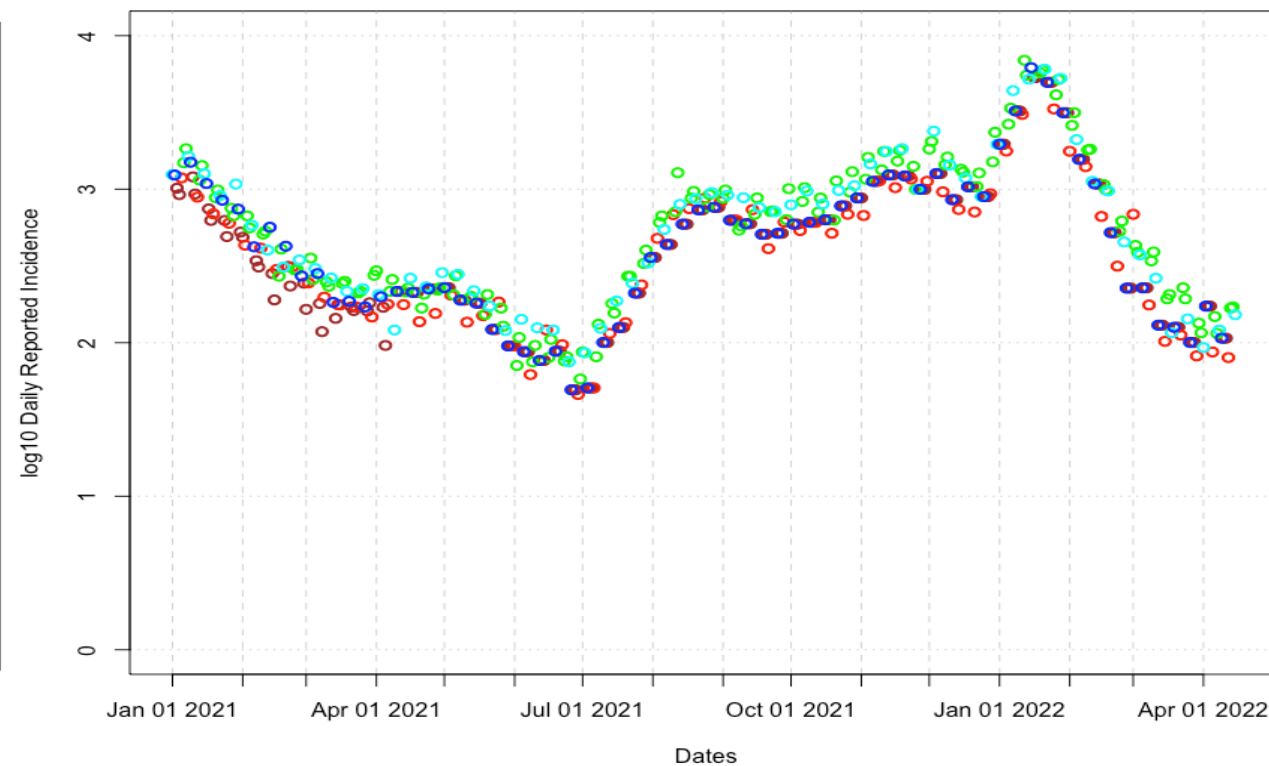
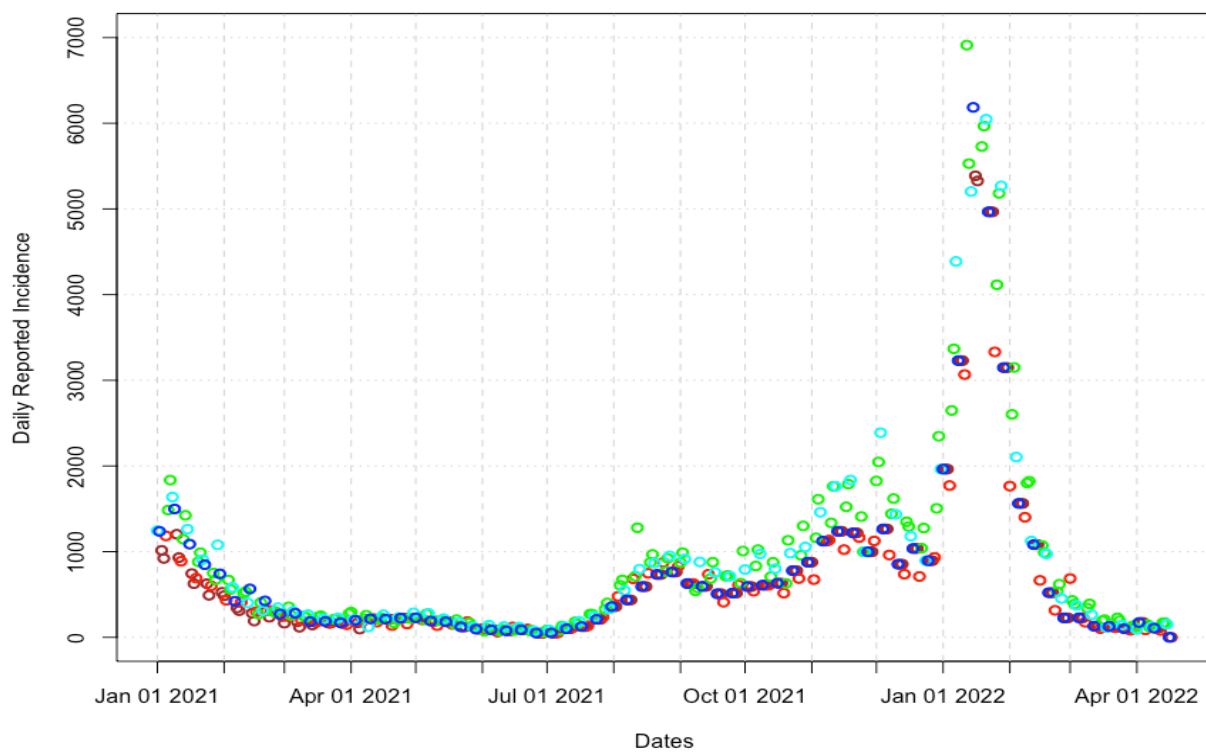
- NM daily incidence is likely rising. Drop in the death rate to 1/2x is highly notable, as well as the increase in the number of deaths.
- No clear evidence for *substantially* more immune evasion by BA.2 than by BA.1.
- Reduced indoor masking in congregated settings is likely playing a role in the current epidemic.
- Updated vaccine immunogens may be necessary to lower the rate of serious medical outcomes by late 2022.
- Situational awareness was good in January 2022. Current data of high value for adaptive mitigation.
- Delayed or incomplete vaccination confers a significant risk of adverse outcomes



# A look at the raw incidence data

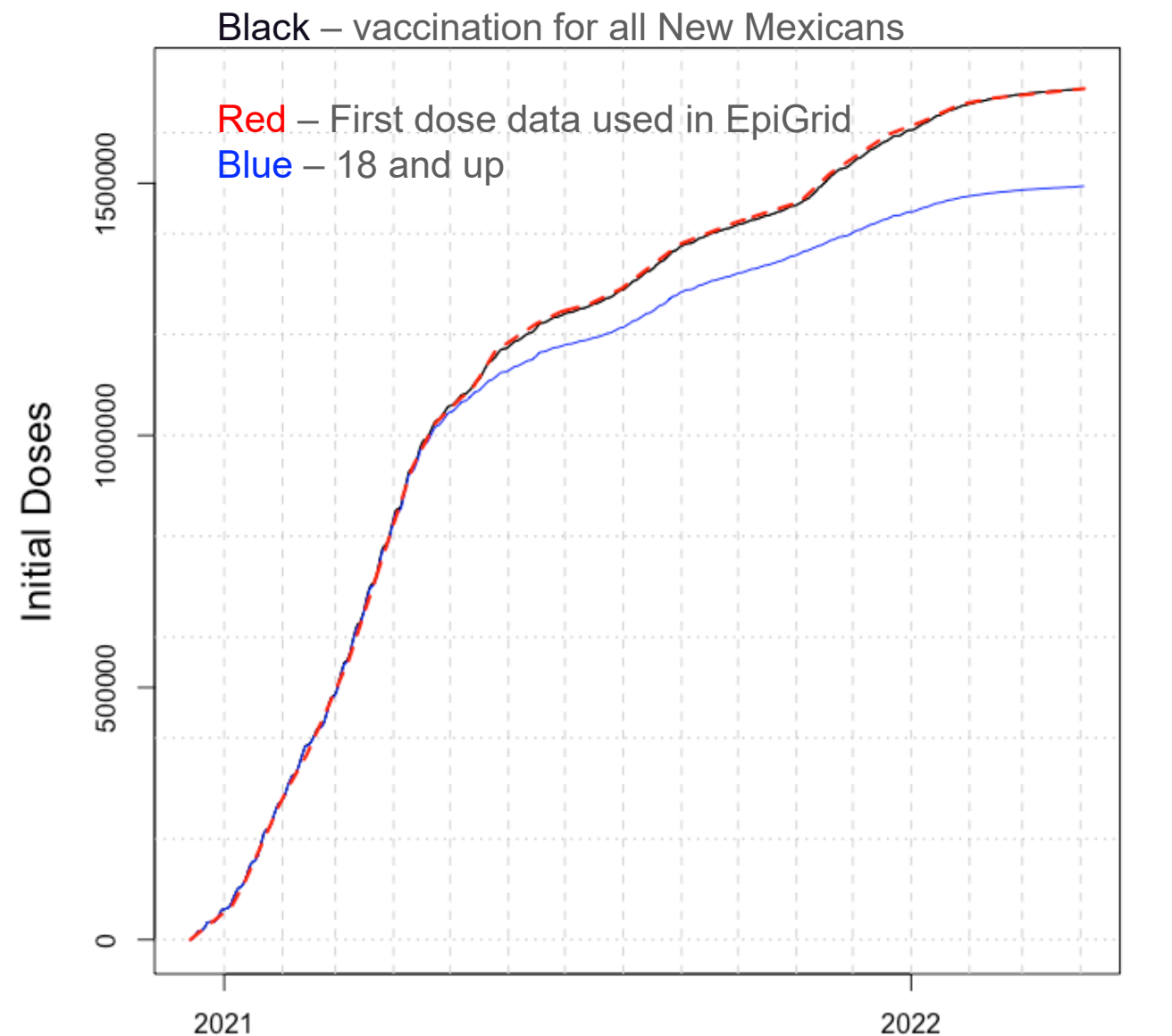
- Sunday, Monday
  - Tuesday
  - Wednesday/Thursday
  - Friday
  - Saturday
- The reported incidence is now rising slowly, or possibly flat, ignoring within-week variation.
  - Color-coded by-day-of-week incidence provides visual first evidence of rising incidence.
  - Within-weekly variation in NM data is resolved. It was partly an analysis artifact, now corrected.

The 190 cases in the Lea county correctional facility are removed from data reported on March 26<sup>th</sup>, 2021. The 1/3 of reported cases that were > 2 weeks prior were removed from March 24<sup>th</sup>, 2021. Case reported for weekends starting April 10-12<sup>th</sup>, 2021 are each divided by 3 to estimate individual day counts.



# 19 April 2022 Vaccine Analysis (NM): currently starting an epidemic/wave

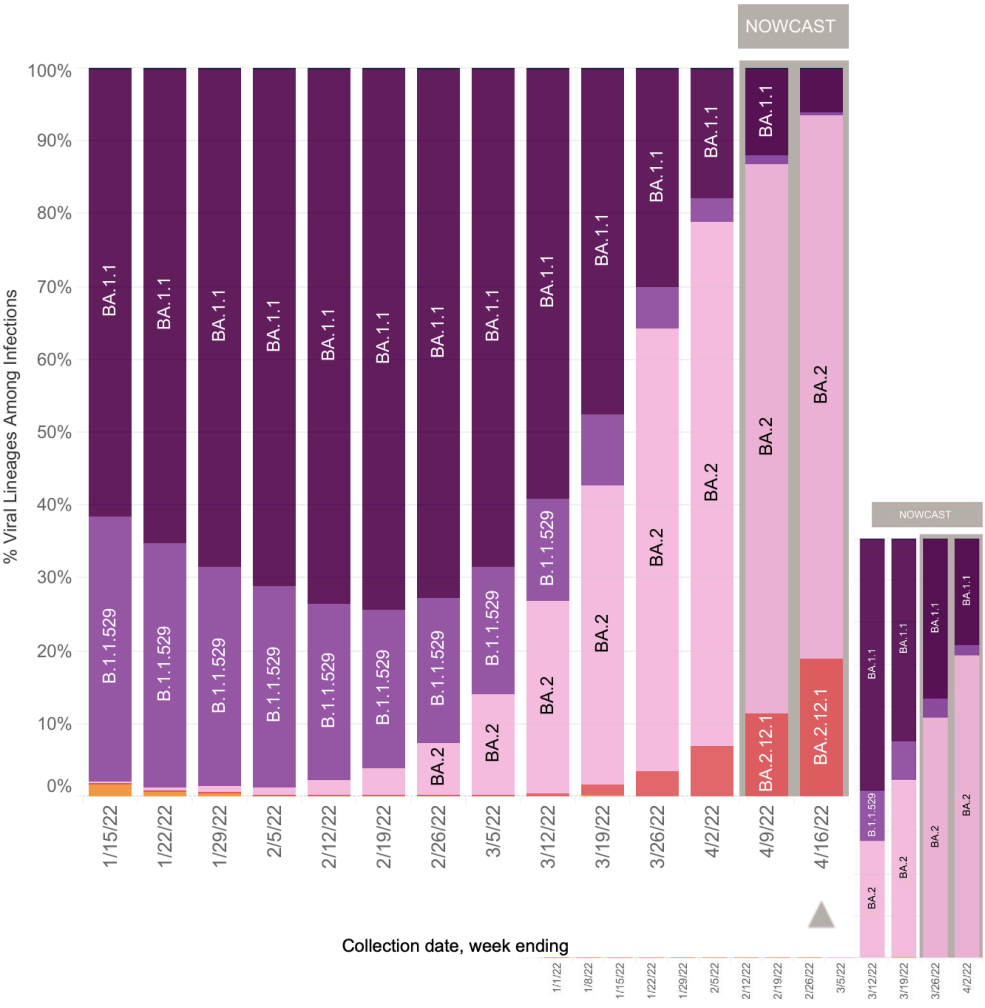
- 1693k first doses are used in modeling (4/19/22).
  - 1693k first doses have been administered, +5k/2, +1k/2, +1k/2.
  - 1444k completed initial vaccine series, +5k/2, +4k/2, +4k/2.
  - 850k boosters completed, +69k/2, +10k/2, +11k/2.
  - 56k fourth doses completed, +56k/2
  - ~80.7% of all persons in New Mexico are base-line vaccinated.
  - ~94.5% of all New Mexicans are eligible (~1981k).
  - $80.7/94.5=85.4\%$  of eligible New Mexicans vaccinated.
  - 5-11 year old vaccinations continue to be slow.
- 
- Vaccination is mixed. Rate of doses 3 and 4 uptake is good, but
  - $794k * \sim 1/3 = >200k$  eligible for dose 4, but not yet inoculated.
  - 594k eligible for dose 3 who have not yet received it.
  - Conclusion: Expect waning immunity in May 2022, and
  - By-county 3<sup>rd</sup>-dose variation is large; likely to give large by-county variations in population-level severity.
- 
- Vaccines with updated antigens likely of high utility by late 2022.



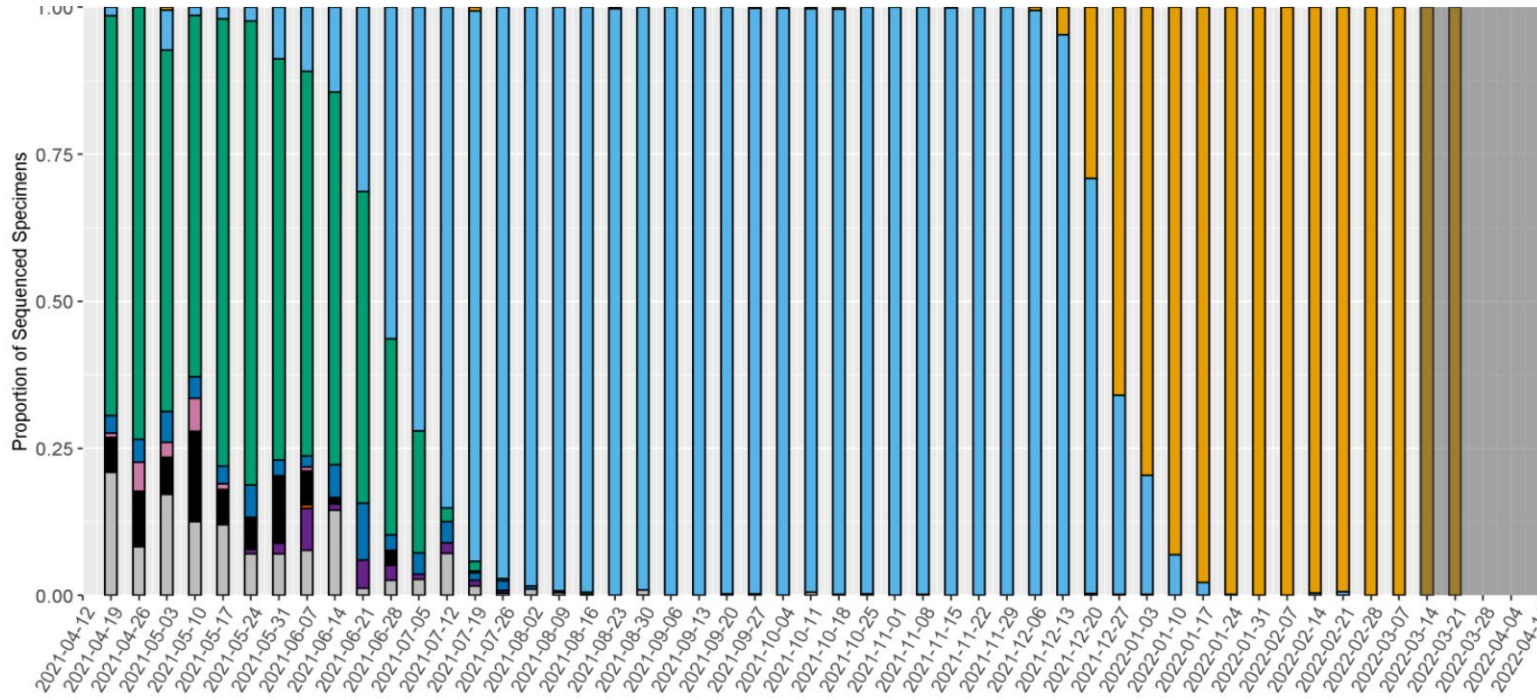
US Census Bureau reports 2097k people in New Mexico.

# Variant Monitoring: Omicron is the current variant

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



- A slow rise in US incidence while BA.2 is already a majority requires a smaller role for immune evasion.
- NM data on BA.2 inconclusive for immune evasion driving the epidemic.
- Case growth rates (~2x/month) are slower than BA.2 replacement rate (~2x/week). These rates are early rates, before “saturation” of the replacement.
- New variants have appeared without evident intermediates. Global and wastewater monitoring.
- Approximately 6-12 months is the longest variant-interval: D614G (~3 months), Alpha (~6-9 months), Delta (~6 months), Omicron (~6 months). *Short interval for BA.2?*



Screenshot-only of CDC variant data, no static image available

# Recent By-State Trends: Most Populous 10 States

Trends over the last 1-3 weeks: *Increasing:* California, Florida, Georgia, Illinois, Michigan, New Mexico, New York, N. Carolina, Ohio, Pennsylvania, *Flat:* Texas. *Declining:*

	Cases	Deaths	
New York	29.59	0.043	Daily rates per 100,000 residents averaged April 11 <sup>rd</sup> 2022 thru April 17 <sup>st</sup> 2022.
Michigan	19.26	0.173	
Ohio	5.86	0.122	
Florida	8.81	0.087	
New Mexico	6.05	0.339	
Illinois	15.99	0.058	
Texas	4.74	0.091	
California	9.5	0.113	
North Carolina	6.59	0.101	
Georgia	5.05	0.232	
Pennsylvania	9.31	0.071	

