

Modeling & Forecasting COVID-19 in NM

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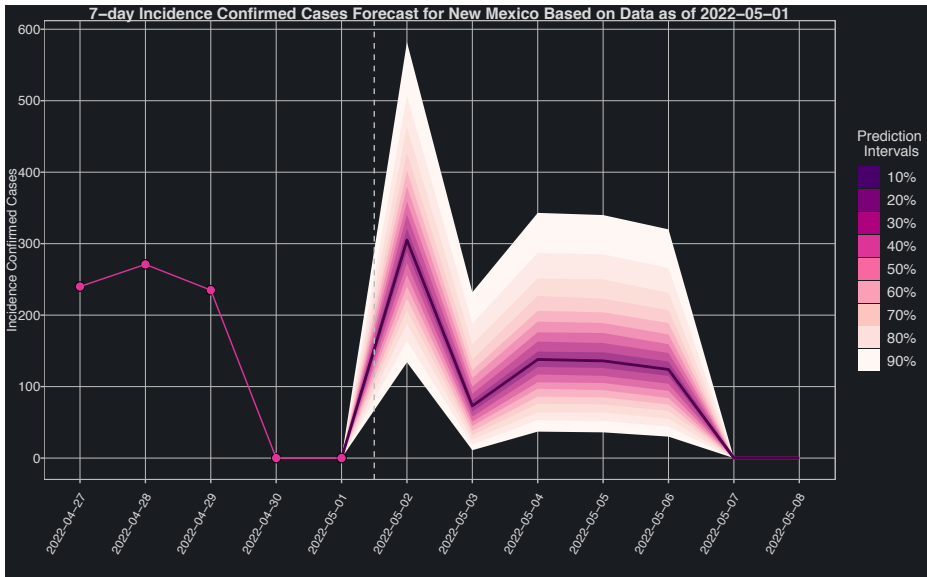
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Short- & Long-Term Forecast for NM: Cases



6-Week Forecast of Confirmed Cases for New Mexico Based on Data as of 2022-05-01

Week	Best Case (5th Percentile)	Middle Case (50th Percentile)	Worst Case (95th Percentile)
2022-05-01		522,329*	
2022-05-08	522,580	523,104	524,151
2022-05-15	522,929	524,091	526,251
2022-05-22	523,312	525,196	528,612
2022-05-29	523,713	526,412	531,278
2022-06-05	524,057	527,673	534,211
2022-06-12	524,362	529,026	537,525

*Last reported confirmed cases count



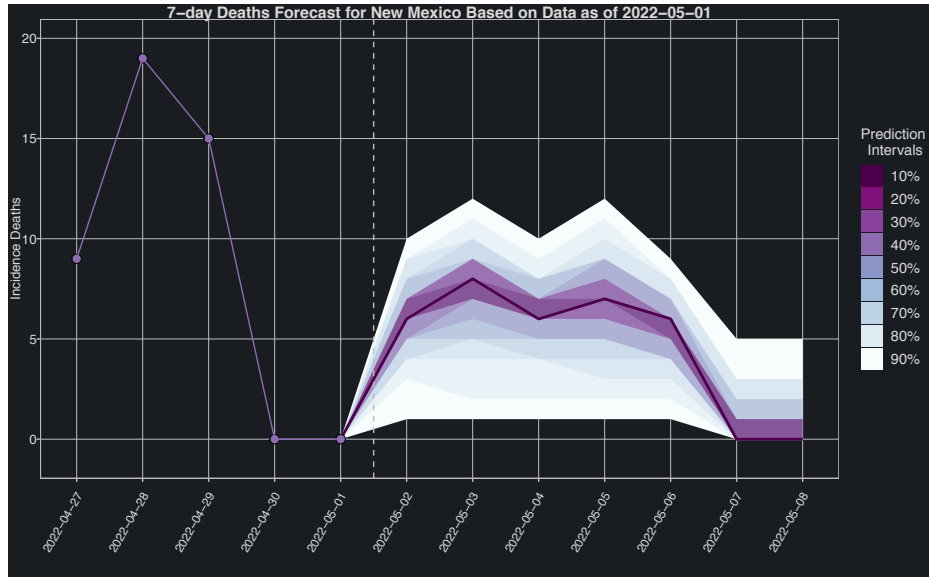
6-Week Forecast of Daily Average of Confirmed Cases for New Mexico Based on Data as of 2022-05-01

Week End Date	Best Case (5th Percentile)	Middle Case (50th Percentile)	Worst Case (95th Percentile)
2022-05-01		187*	
2022-05-08	35	111	260
2022-05-15	48	140	305
2022-05-22	53	159	346
2022-05-29	50	172	390
2022-06-05	45	181	434
2022-06-12	38	187	485

*Last reported confirmed cases count

So what?
 Our model suggests that the number of daily cases is expected to range between 35 and 490 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 2022-05-01

Week	Best Case (5th Percentile)	Middle Case (50th Percentile)	Worst Case (95th Percentile)
2022-05-01		7,499*	
2022-05-08	7,504	7,535	7,554
2022-05-15	7,509	7,565	7,608
2022-05-22	7,514	7,594	7,663
2022-05-29	7,520	7,621	7,721
2022-06-05	7,527	7,646	7,784
2022-06-12	7,534	7,670	7,856

*Last reported deaths count



6-Week Forecast of Daily Average of Deaths for New Mexico Based on Data as of 2022-05-01

Week Start Date	Best Case (5th Percentile)	Middle Case (50th Percentile)	Worst Case (95th Percentile)
2022-05-01		8*	
2022-05-08	1	5	9
2022-05-15	1	4	8
2022-05-22	1	4	9
2022-05-29	1	4	10
2022-06-05	1	3	11
2022-06-12	1	3	11

*Last reported confirmed deaths

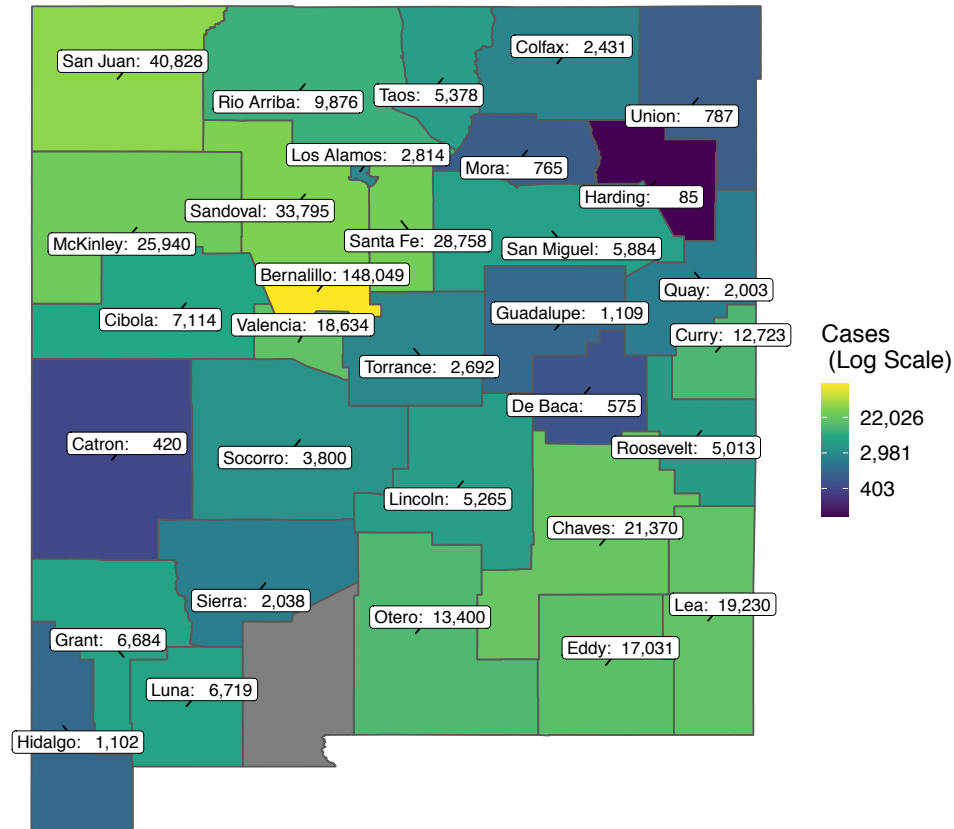
So what?

Our model suggests that the number of daily deaths is expected to range between 1 and 11 in the next few weeks

Cumulative Cases & Daily Growth Rate for NM: May 1

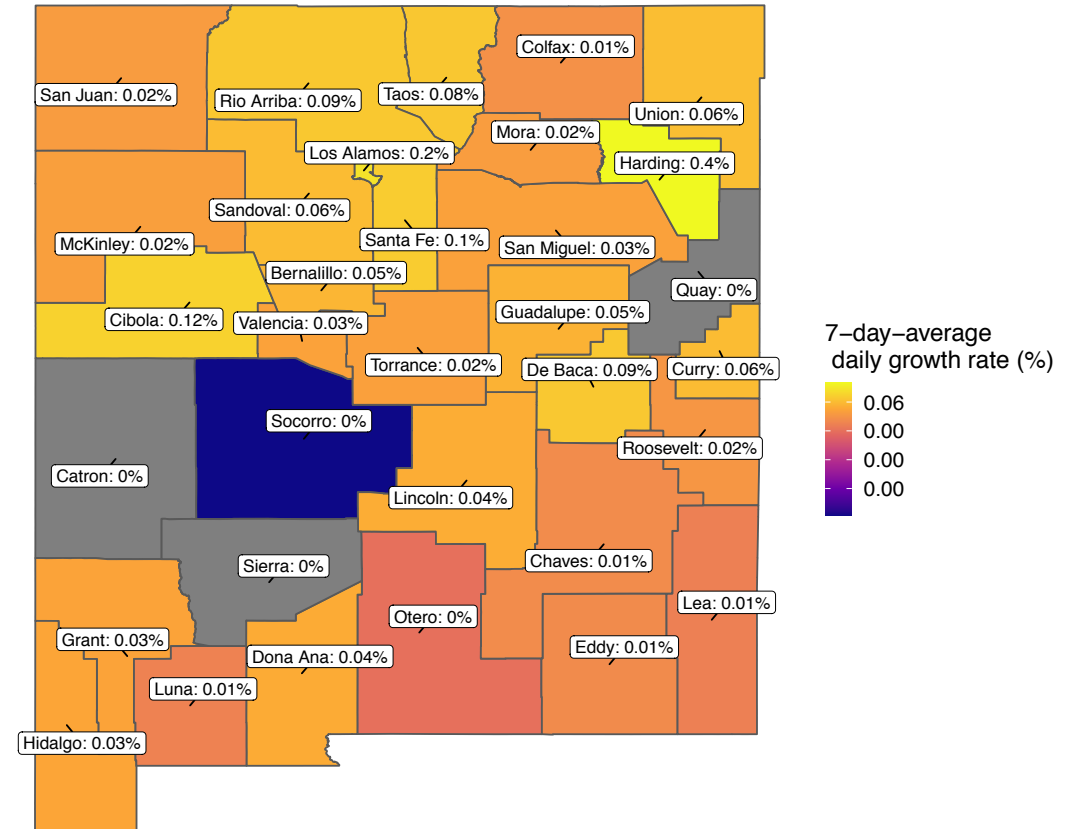
Cumulative Cases: 2022-05-01

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



County COVID-19 Weekly Growth Rate

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

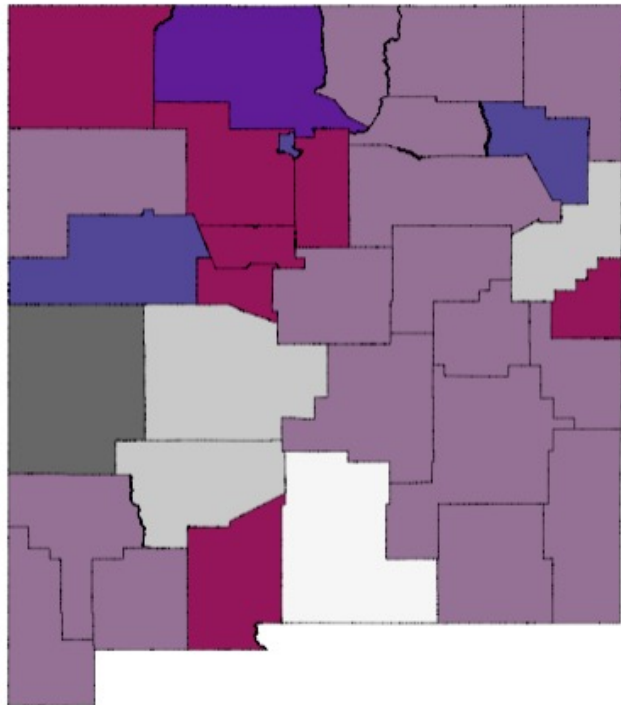


Harding, Los Alamos, Cibola, and Santa Fe counties have the highest cumulative growth rates.

*Growth rate is in cumulative cases

Weekly Growth Rate for NM: Another View (May 2)

Impacted New Mexicans



Counties with New Cases This Week

Growth Rate	Accelerating	0k	1.44M	39k
	Constant	0k	465k	46k
	Decelerating	66k	0k	0k
		Low	Med	High
		Cases Per Capita		

Counties With No New Cases In ...

37k	0k	4k
Last Week	Two Weeks	3+ Weeks

So what?

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

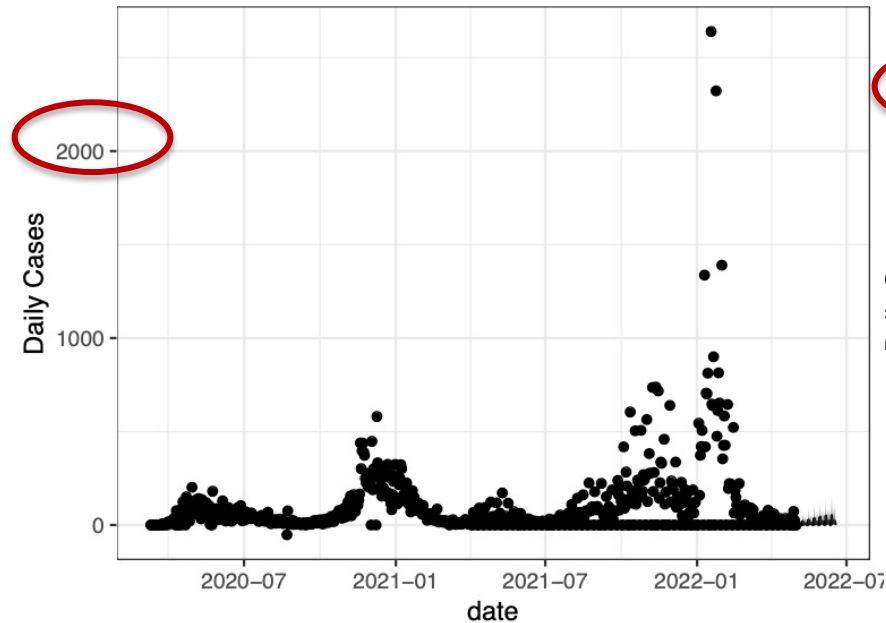
Number of New Mexicans living in regions with particular combinations of per capita case counts and 7-day growth rates

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

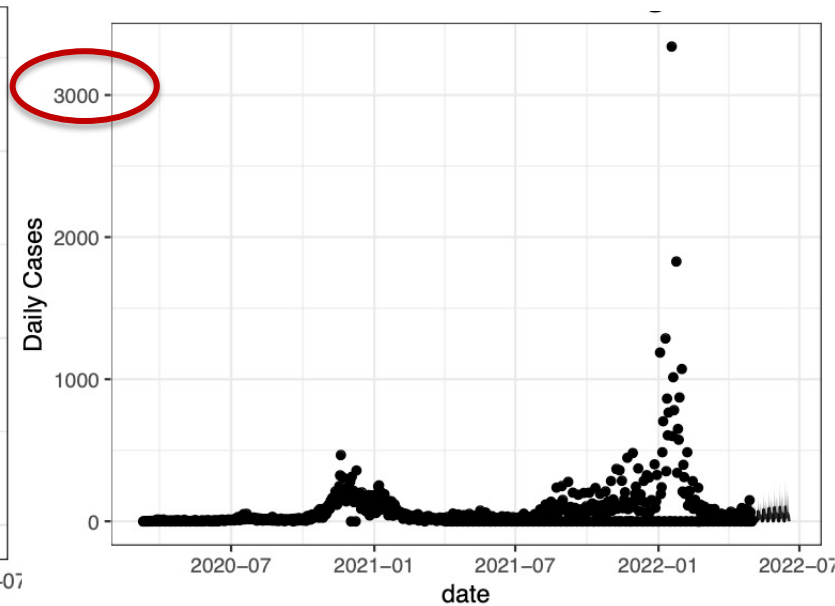
> **Additional Regional Forecasts**

Central & North Regions Daily Cases Forecast

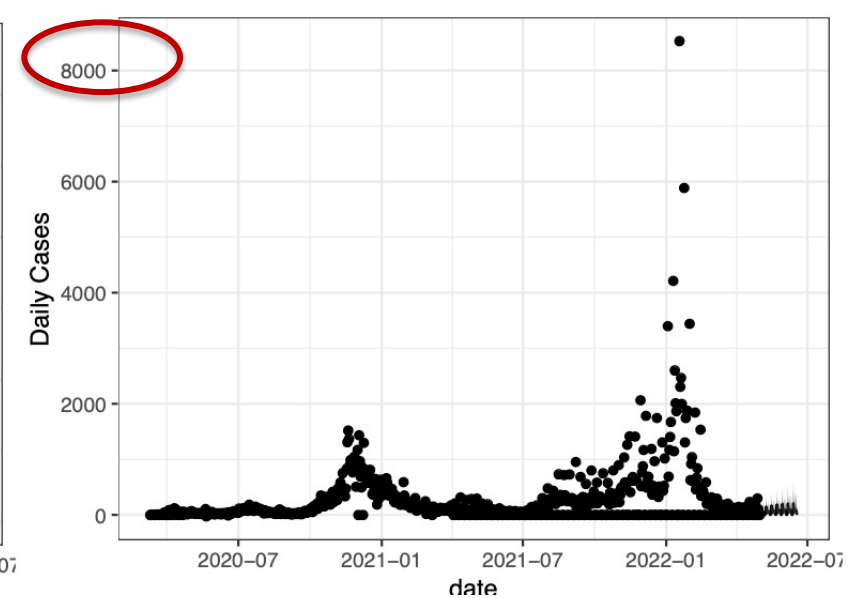
Northwest



Northeast



Central

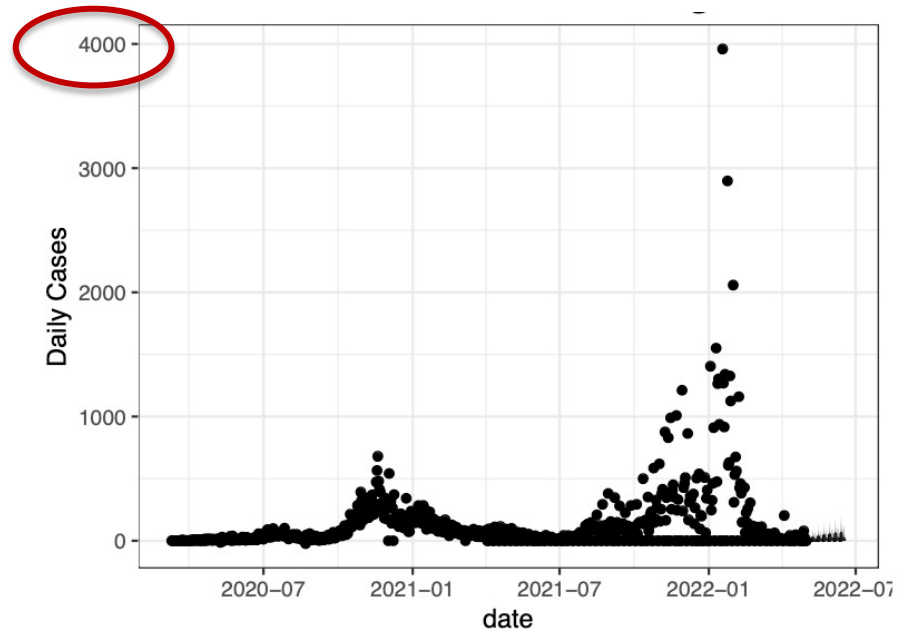


So what?

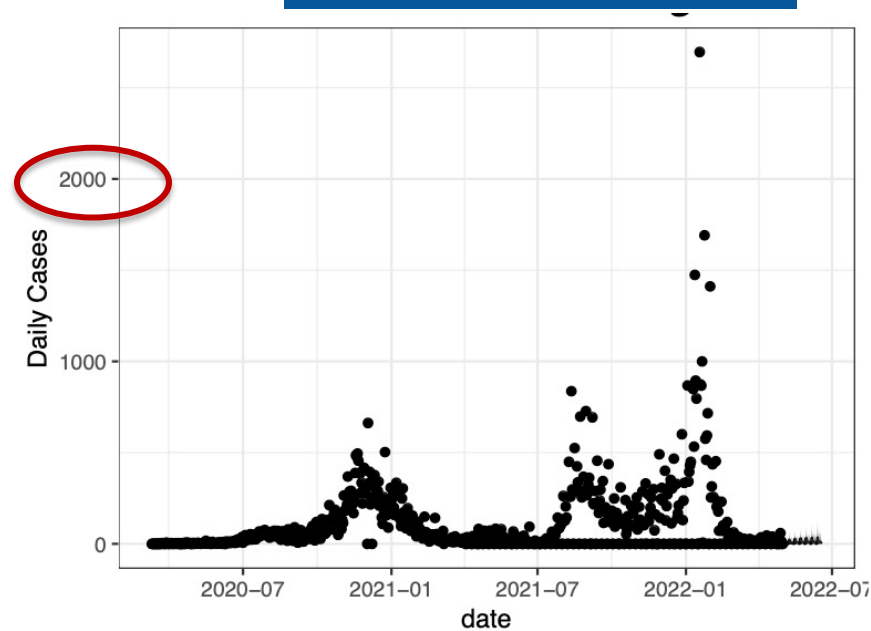
**The Central region is expected to see the most number of cases.
Cases appear to be plateauing.**

South Regions Daily Cases Forecast

Southwest



Southeast

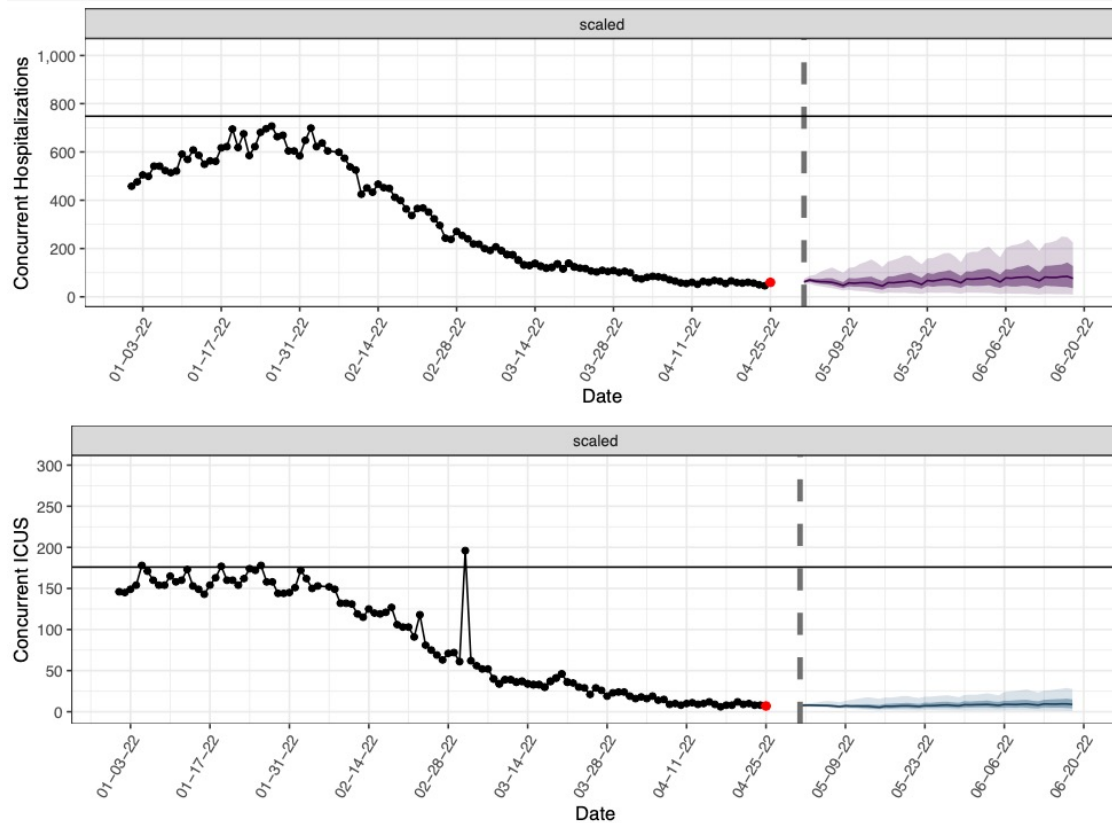


So what?

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

> 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

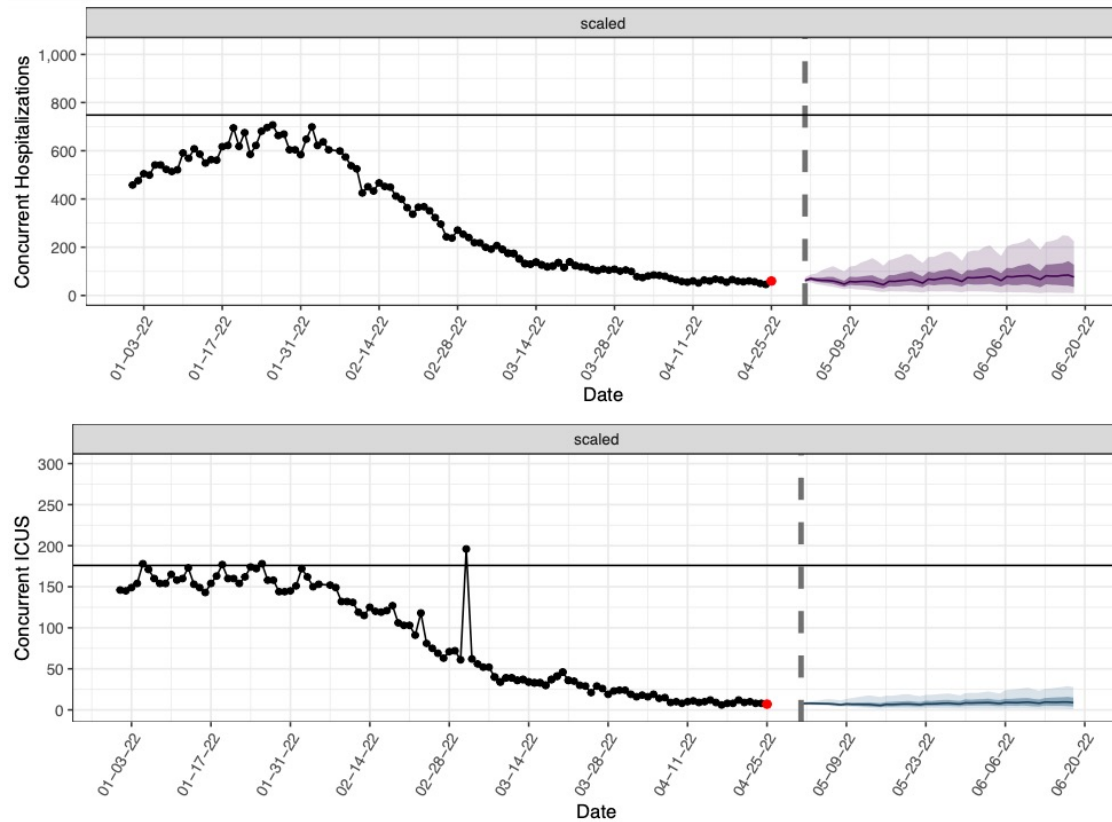
Week	Qu. 5% (best case)	Qu. 50% (median)	Qu. 95% (worst case)
5/8/22	4	6	12
5/15/22	2	5	16
5/22/22	1	6	17
5/29/22	1	7	18
6/5/22	1	8	20
6/12/22	1	8	23

“Scaled” Scenario

So what?

Model is predicting a plateau in COVID-19 ICU beds needed over the next several weeks

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



Concurrent COVID-19 non-ICU “med-surge” beds

Week	Qu. 5% (best case)	Qu. 50% (median)	Qu. 95% (worst case)
5/8/22	23	41	88
5/15/22	12	39	108
5/22/22	11	45	118
5/29/22	12	51	126
6/5/22	10	54	144
6/12/22	8	58	168

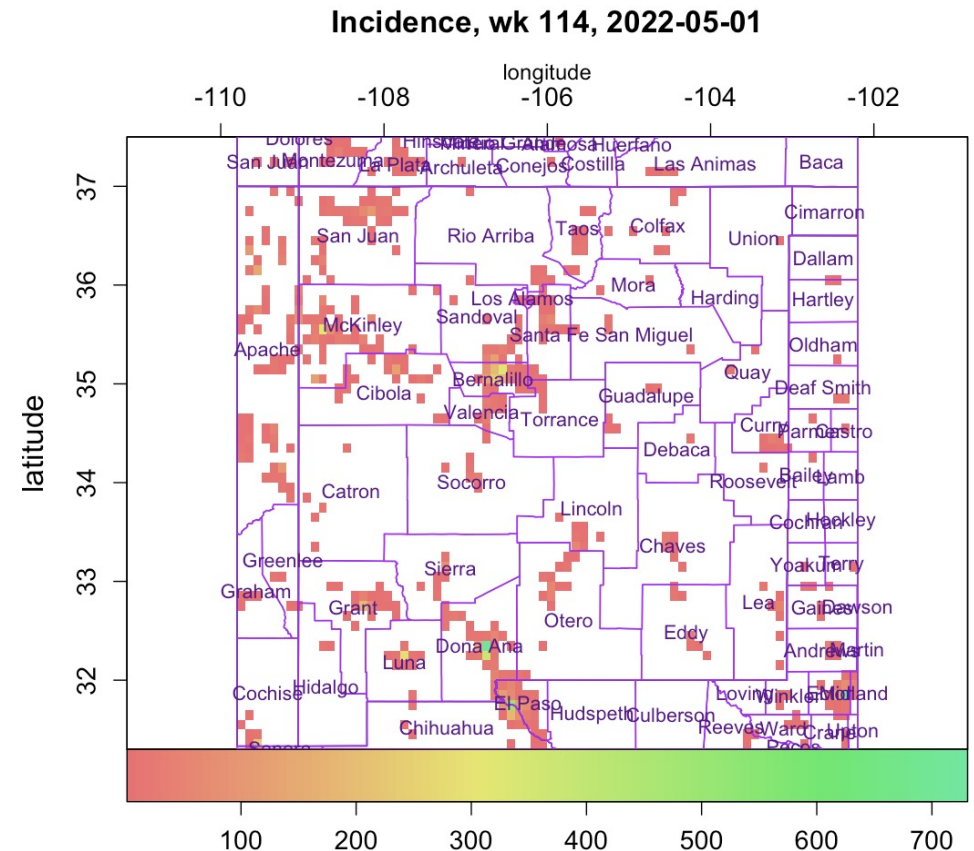
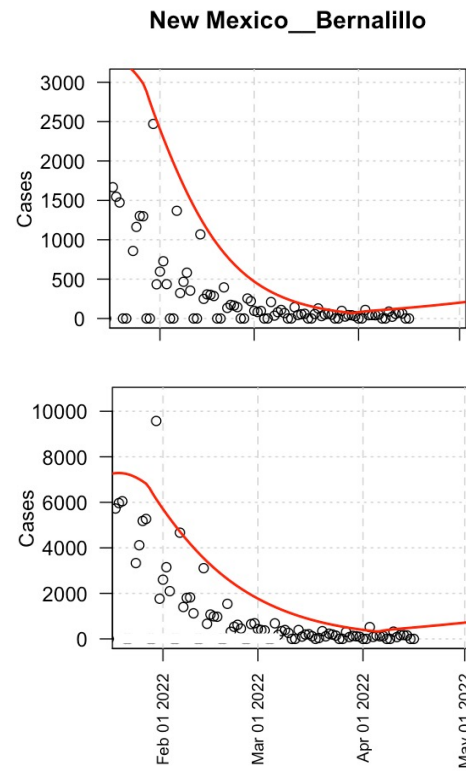
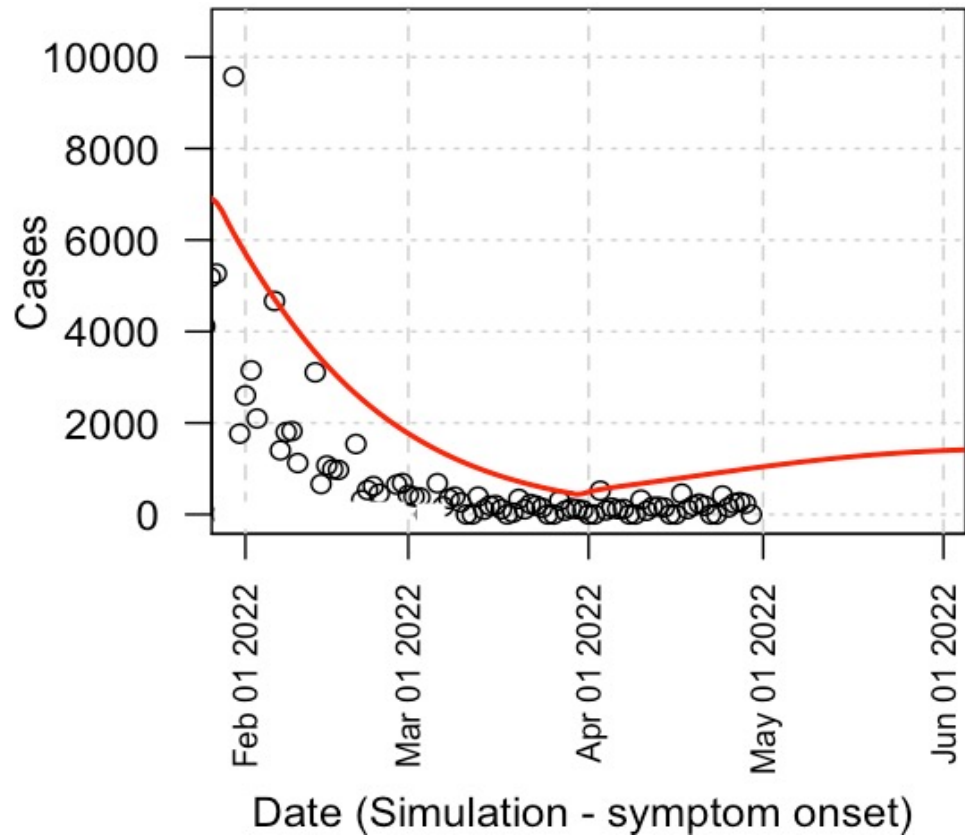
“Scaled” Scenario

So what?

Med-surge general bed needs are predicted to plateau overall during the next 3 weeks

3 May 2022: Epigrad modeling

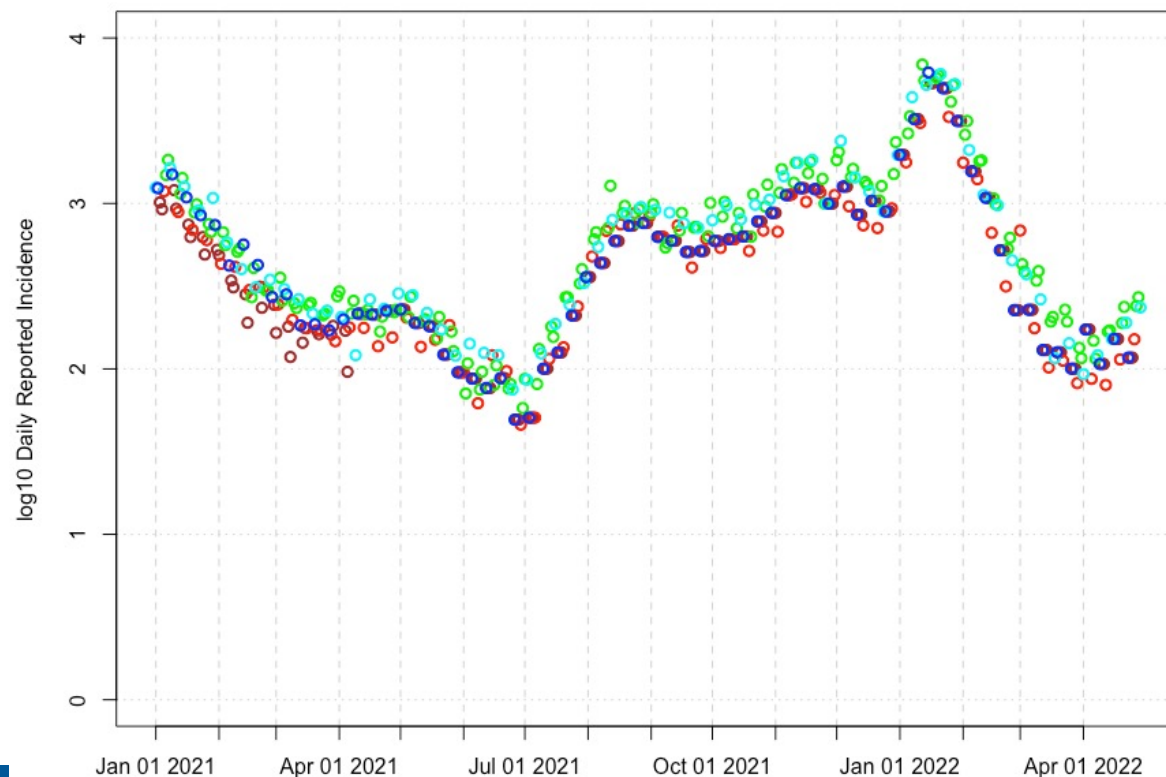
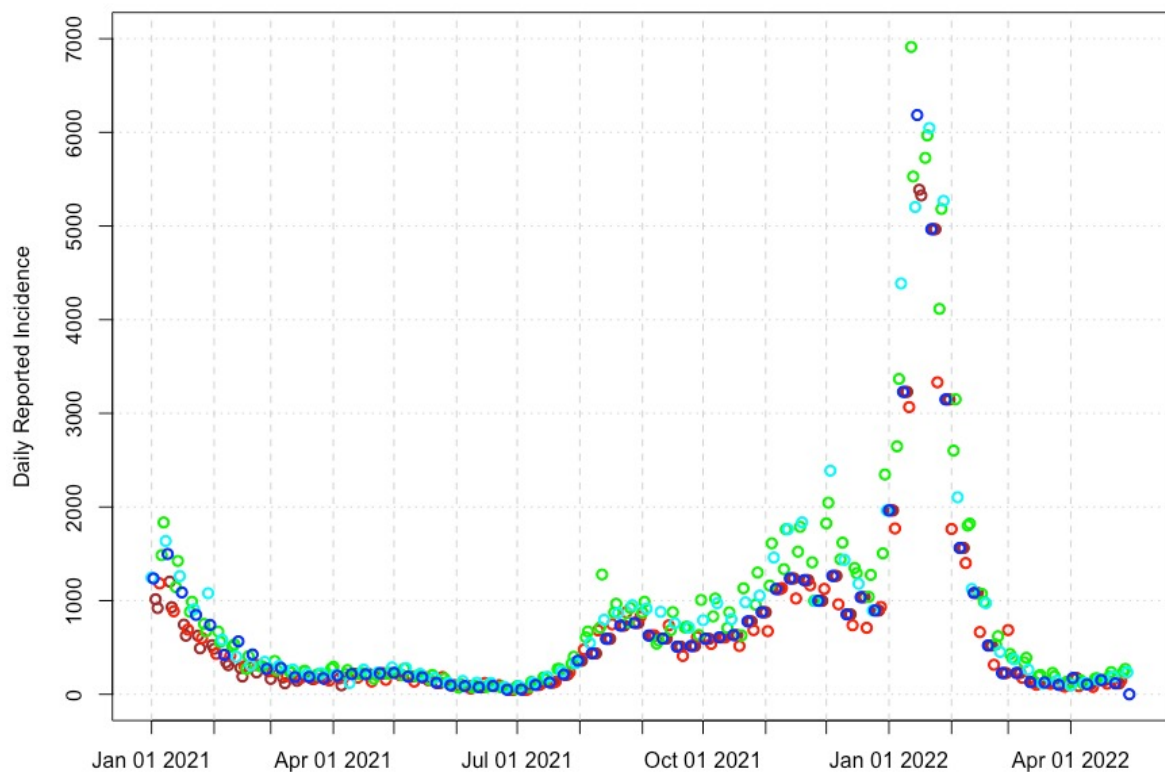
- NM daily incidence is rising. Drop in the death rate to 1/2x is notable.
- Modest immune evasion by BA.2.12.1 relative to BA.1 likely important.
- Waning immunity is also likely significant to the current rise in daily incidence.
- Reduced indoor masking facilitates community spread.
- Use of high-quality, well-fitted N95s enhances stopping transmission of covid. Hospital data can be evaluated to show the effect.
- Disease severity in individuals lacking robust immune history from vaccination can be more serious than unvaccinated.



A look at the raw incidence data

- Sunday, Monday
- Tuesday
- Wednesday/Thursday
- Friday
- Saturday
- The reported incidence is now rising.
- Color-coded by-day-of-week incidence is rising.

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

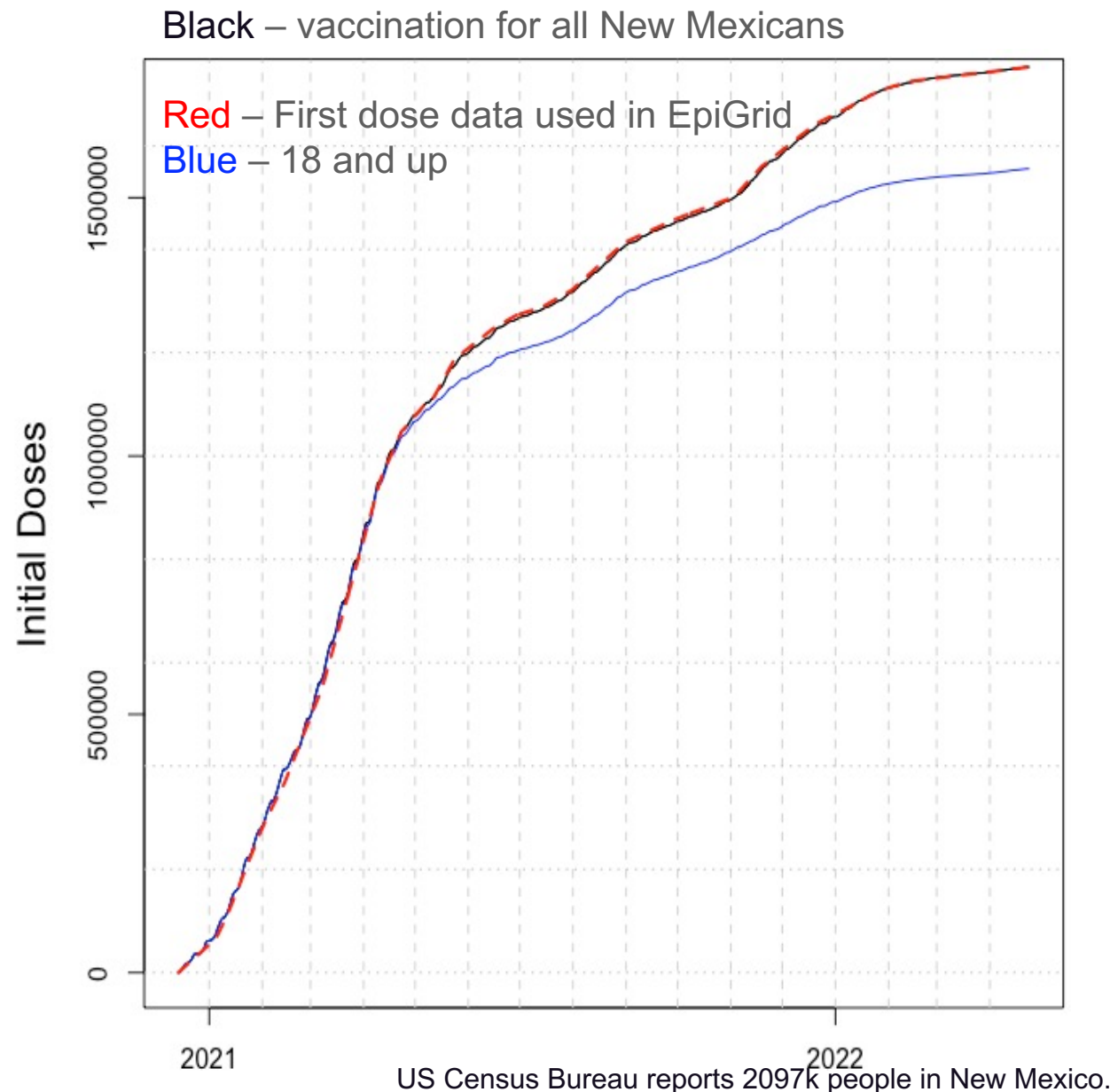


26 April / 3 May 2022 Vaccine Analysis (NM)

- 1753k first doses are used in modeling (4/26/22).
- 1753k first doses have been administered,
- 1479k completed initial vaccine series, +35k/2, +5k/2, +4k/2.
- 805k boosters completed
- 78k fourth doses completed
- 5-11 year old vaccinations continue to be slow.

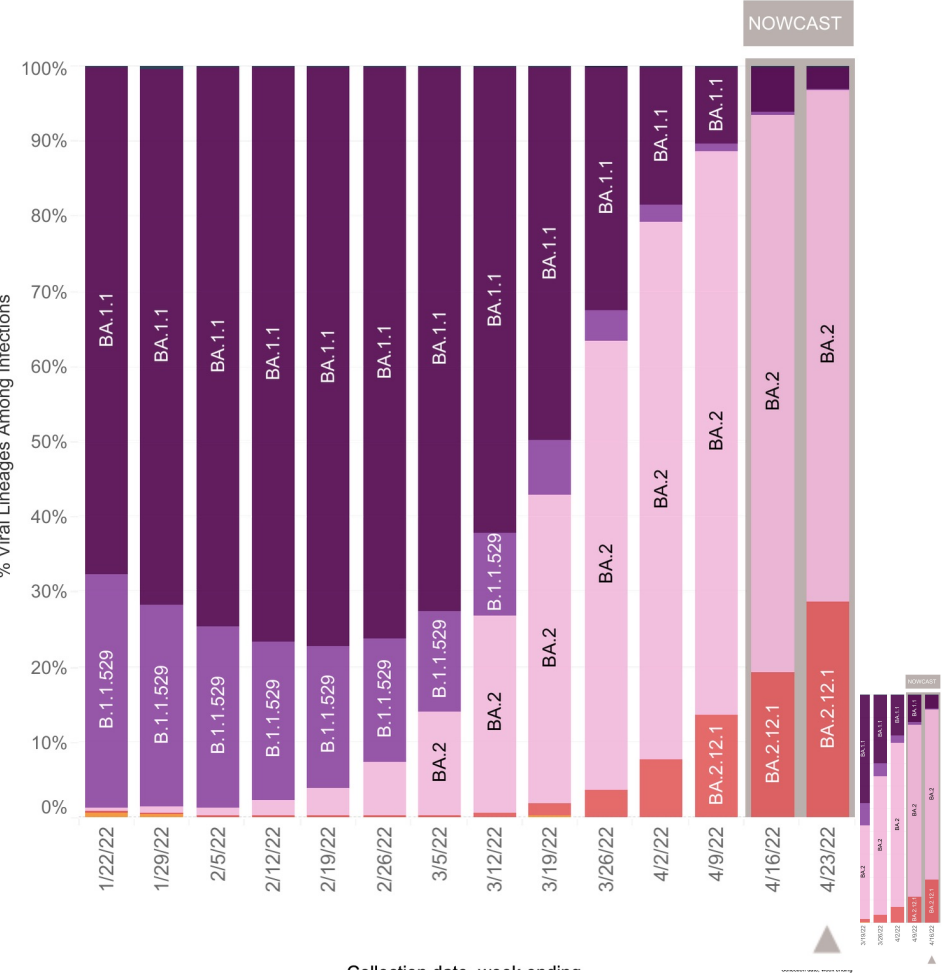
- 805k * ~1/3 = >200k eligible for dose 4, but not yet innoculated.
- ~600k eligible for dose 3 who have not yet received it.
- **Conclusion: Expect waning immunity in May 2022**
 - Effect on infection rate likely
 - Effect on severity is possible
- **By-county 3rd-dose variation is large; likely to give large by-county variations in population-level severity.**

- Vaccines with updated antigens likely of high utility before late 2022.

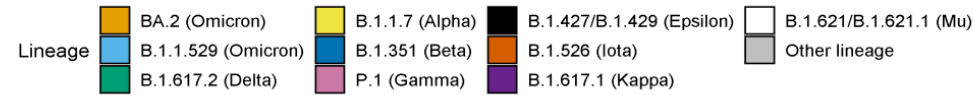
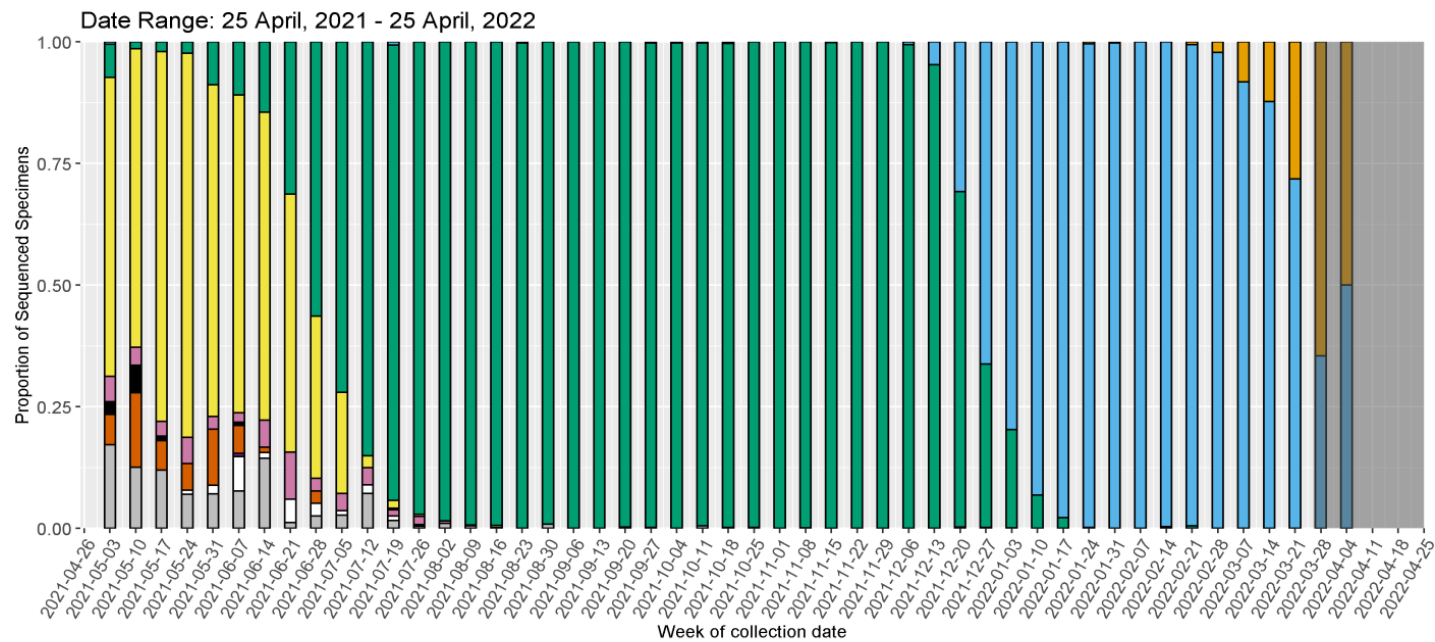


Variant Monitoring: Omicron is the current variant

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



- Viral variant BA.2.12.1 may be moderately more evasive than BA.1 and BA.2
- NM data is consistent with BA.2.12.1 being evasive and contributing to growth.
- Case growth rates (~2x/month) are slower than BA.1
- Unlikely prior variants that appeared without evident intermediates, BA.2.12.1 is a derivative variant.
- Approximately 6-12 months is the longest variant-interval: D614G (~3 months), Alpha (~6-9 months), Delta (~6 months), Omicron BA.1 (~6 months). BA.2.12.1 May be only a 4 months interval.



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, Texas. *Flat*: *Declining*:

	Cases	Deaths
New York	36.66	0.09
Michigan	20.7	0.096
Ohio	10.65	0.083
Florida	17.24	0.077
New Mexico	8.9	0.387
Illinois	28	0.044
Texas	7.67	0.047
California	15.78	0.118
North Carolina	15.72	0.056
Georgia	7.53	0.174
Pennsylvania	14.77	0.084

Daily rates per 100,000 residents averaged April 18th 2022 thru May 2nd 2022.

