

# Modeling & Forecasting COVID-19 in NM

Copyright Notice And Disclaimer

January 18, 2022

For Scientific and Technical Information Only

© Copyright Triad National Security, LLC. All Rights Reserved.

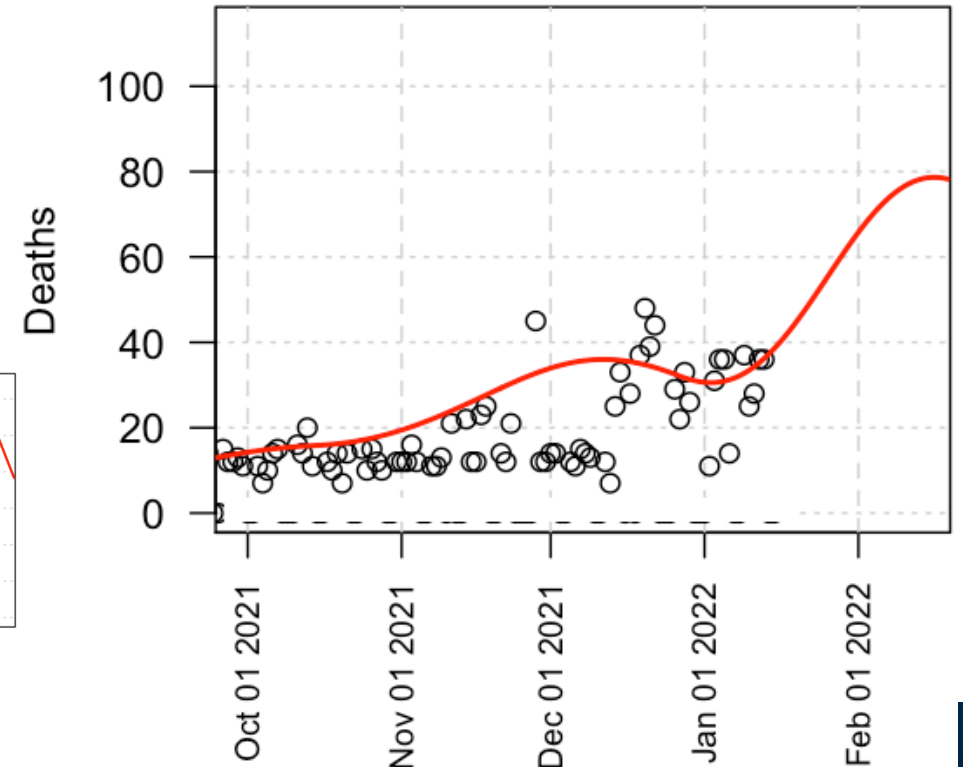
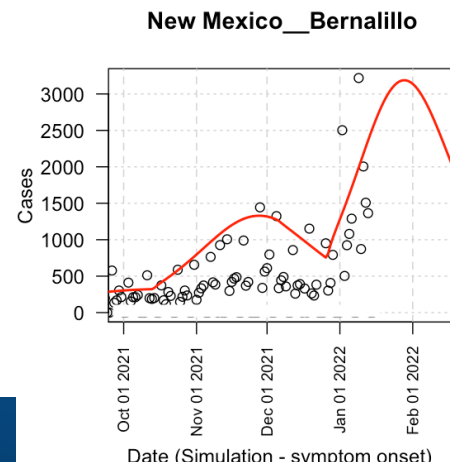
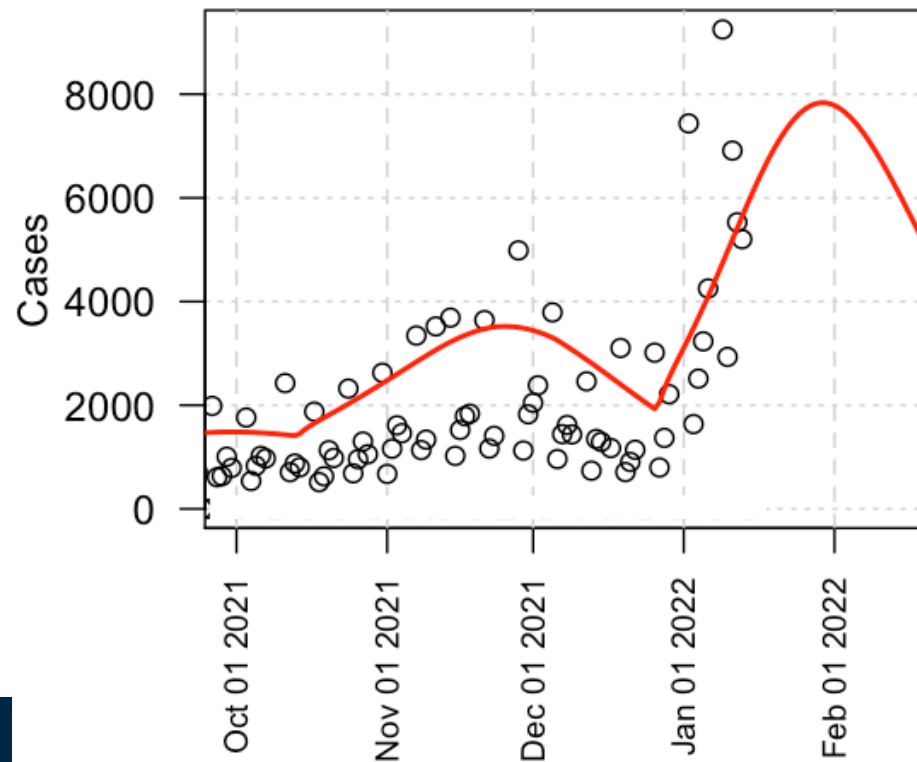
For All Information

Unless otherwise indicated, this information has been authored by an employee or employees of the Triad National Security, LLC., operator of the Los Alamos National Laboratory with the U.S. Department of Energy. The U.S. Government has rights to use, reproduce, and distribute this information. The public may copy and use this information without charge, provided that this Notice and any statement of authorship are reproduced on all copies.

While every effort has been made to produce valid data, by using this data, User acknowledges that neither the Government nor Triad makes any warranty, express or implied, of either the accuracy or completeness of this information or assumes any liability or responsibility for the use of this information. Additionally, this information is provided solely for research purposes and is not provided for purposes of offering medical advice. Accordingly, the U.S. Government and Triad are not to be liable to any user for any loss or damage, whether in contract, tort (including negligence), breach of statutory duty, or otherwise, even if foreseeable, arising under or in connection with use of or reliance on the content displayed on this site.

# 18 Jan 2022: Epigrad modeling (Red line is 12Jan22 model).

- New Mexico incidence has risen sharply. Viral evolution leading to the Omicron variant is the primary driver of the rise.
- Daily incident events are consistent with gradually improving compliance with respiratory infection control. Further improvement possible.
- Statewide peak in daily incidence is estimated for the last week of January. A lower, flatter, peak is possible with improved infection control.
- Boosting is a strong countervailing effect to the evolution-driven rise, and is limiting the rise in cases.
- Fatality model is intended to be pessimistic: it does not account for a possible modest reduction in disease severity.
- No unambiguous evidence for increased intrinsic infectivity of Omicron. Virus evolution and perhaps increased contact over holidays explains rise.
- **Indoor masking remains critical** to moderating all consequence. Respirator use instead of cloth masks may further mitigate consequences.
- New pharmaceuticals will improve the situation when available in large quantities.
- Drug administration is time-sensitive: Rapid contact-tracing is beneficial for early treatment.
- Testing positivity in NM likely reflects some compromised situational awareness in NM, as in nearly all States.

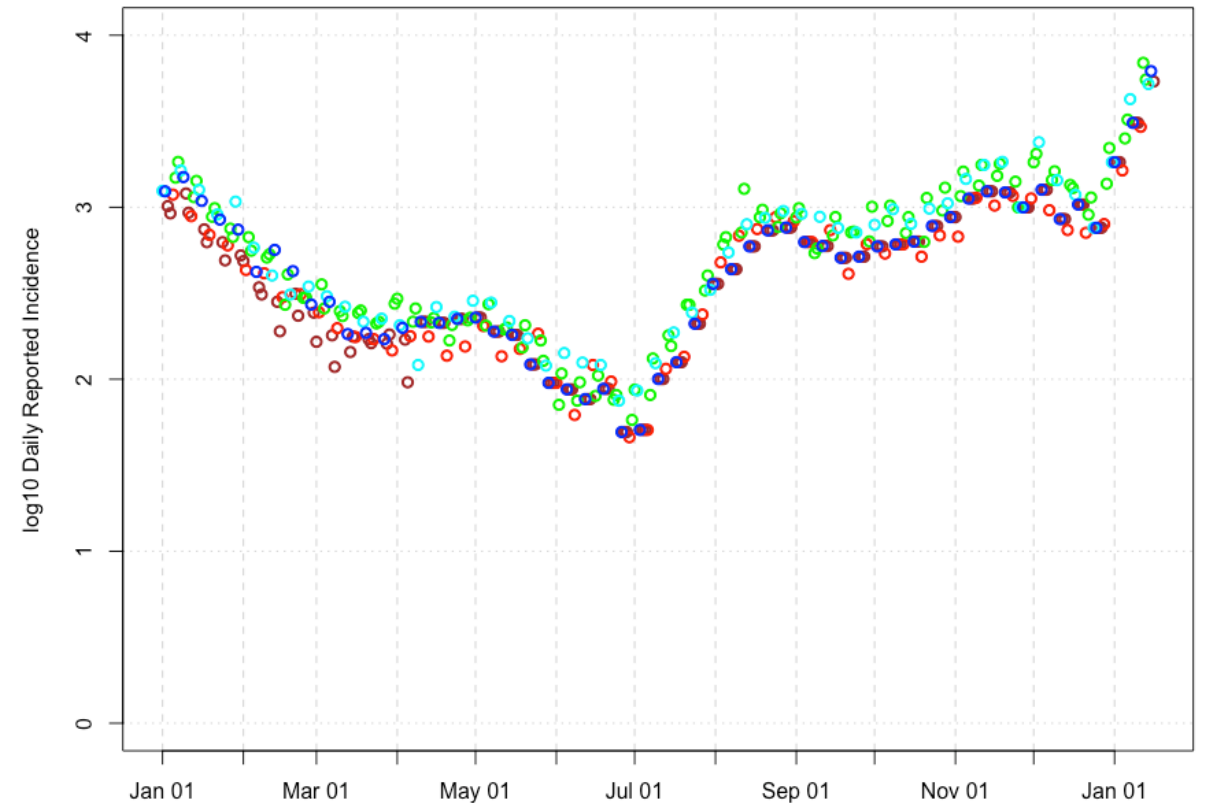
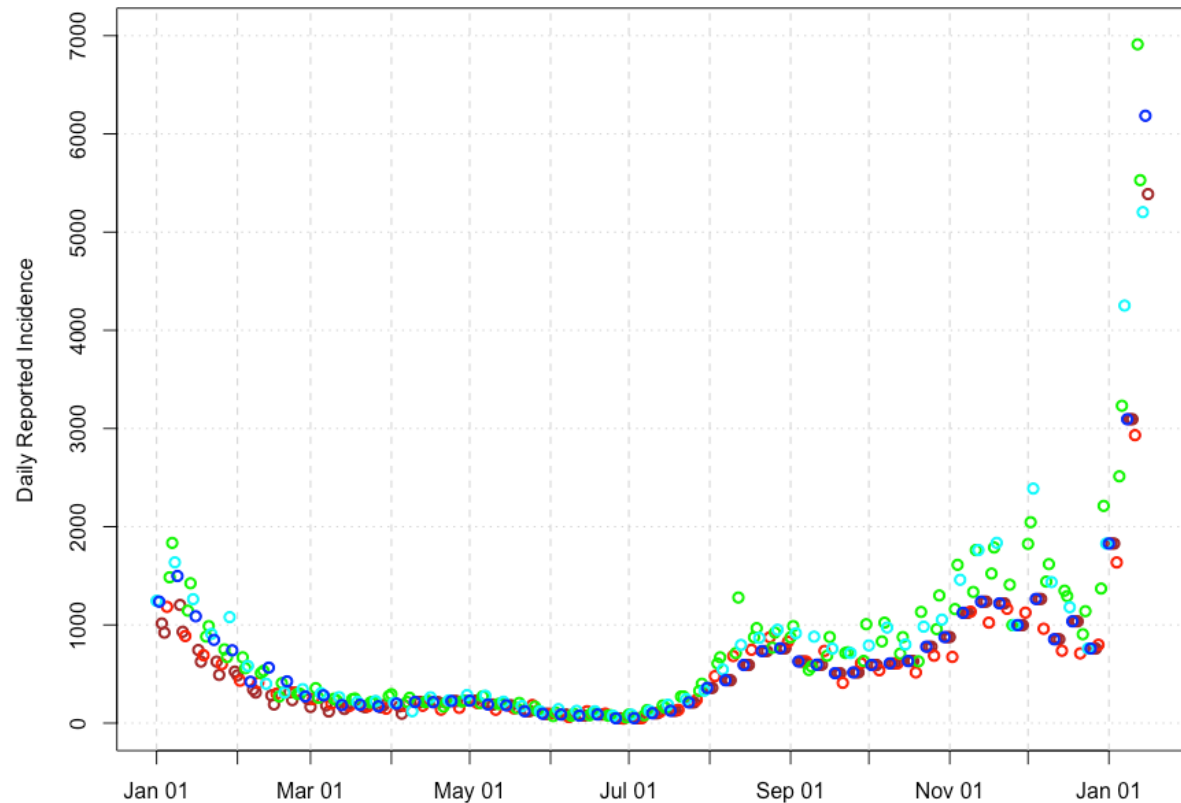


# A look at the raw incidence data

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

- Reported incidence rising, significantly driven by viral evolution leading to Omicron's partial evasion of existing antibody responses.
- T-cell responses likely remain significantly protective, esp. against severe outcomes.
- Within-weekly variation still visible in NM data. Contrast some other states.

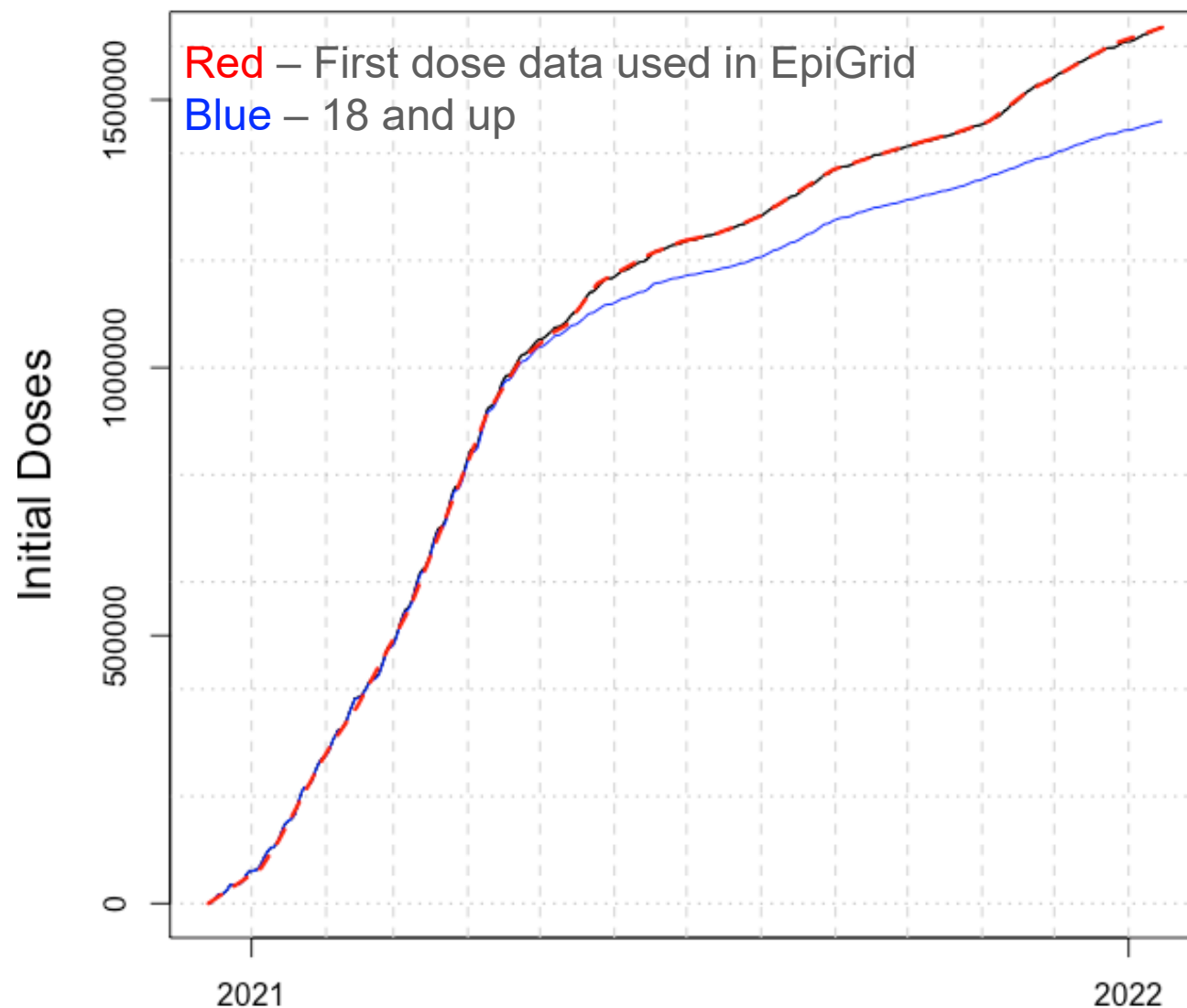
The 190 cases in the Lea county correctional facility are removed from data reported on March 26<sup>th</sup>. The 1/3 of reported cases that were > 2 weeks prior were removed from March 24<sup>th</sup>. Case reported for weekends starting April 10-12<sup>th</sup> are each divided by 3 to estimate individual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



# 17 January 2021 Vaccine Analysis

- 1635k first doses are used in modeling.
- ~1636k first doses have been administered in NM, +13k, +12k.
- ~1380k completed initial vaccine series in NM, +9k, +9k.
- ~652k boosters completed in NM, +35, +33k.
- ~78.0% of all persons in New Mexico are at least minimally vaccinated.
- ~94.5% of all New Mexicans are eligible (~1981k).
- $78.0/94.5=82.6\%$  of eligible New Mexicans vaccinated.
- 5-11 year-olds have received ~57k first doses (32.5%, +1.9%).
- ~461k unvaccinated New Mexicans. Many have been infected.
- ~256k incompletely vaccinated New Mexicans.
- Likely ~350k New Mexicans are relatively unprotected.
- 50% VE against Omicron for initial series ~500k susceptible, less serious outcomes.
- 75% VE boosted against Omicron, ~150k, less serious.
- >345k at higher risk for serious outcome (Omicron). This is ~15% of the population relatively naïve to SARS-CoV-2 (excepting distant T-cell responses).
- >~620k at lower risk for serious outcome (Omicron) but who are susceptible to infection.
- ~1135k functionally immune (Omicron, for now only).
- These numbers depend on the viral-variant.

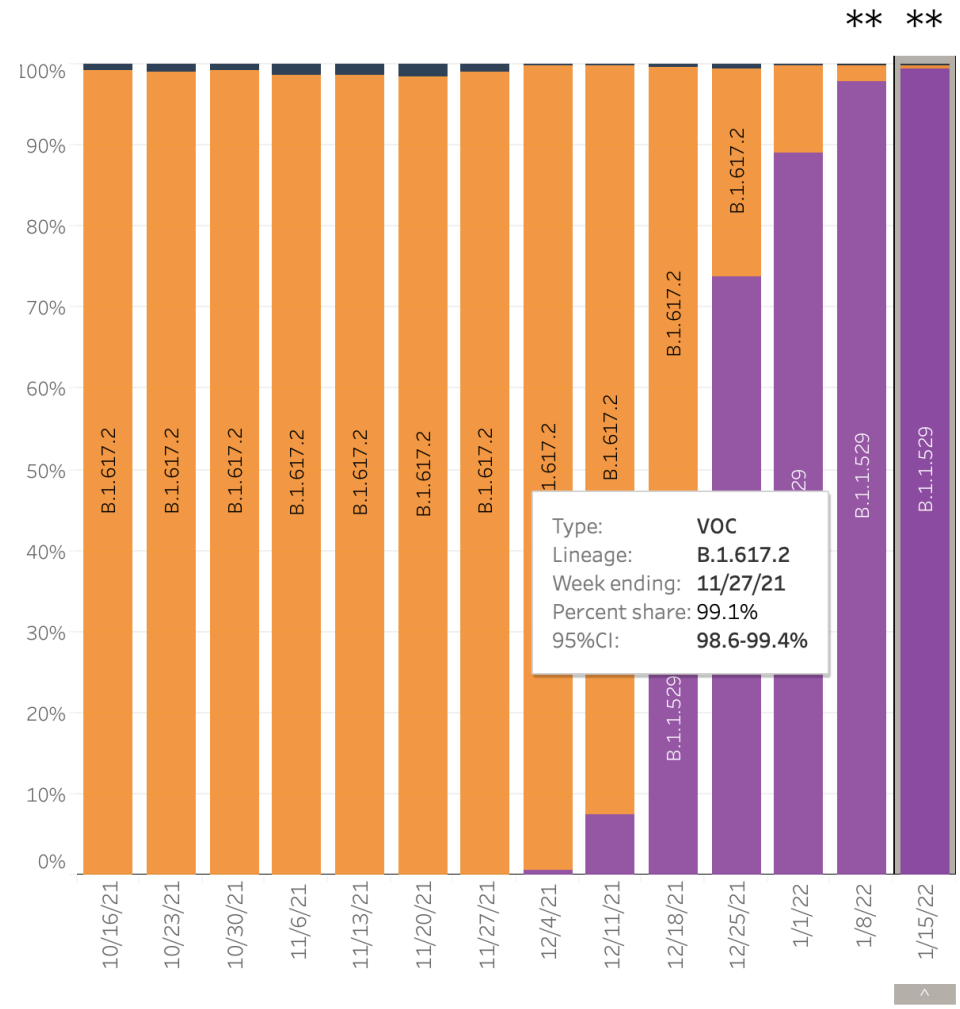
Black – vaccination for all New Mexicans



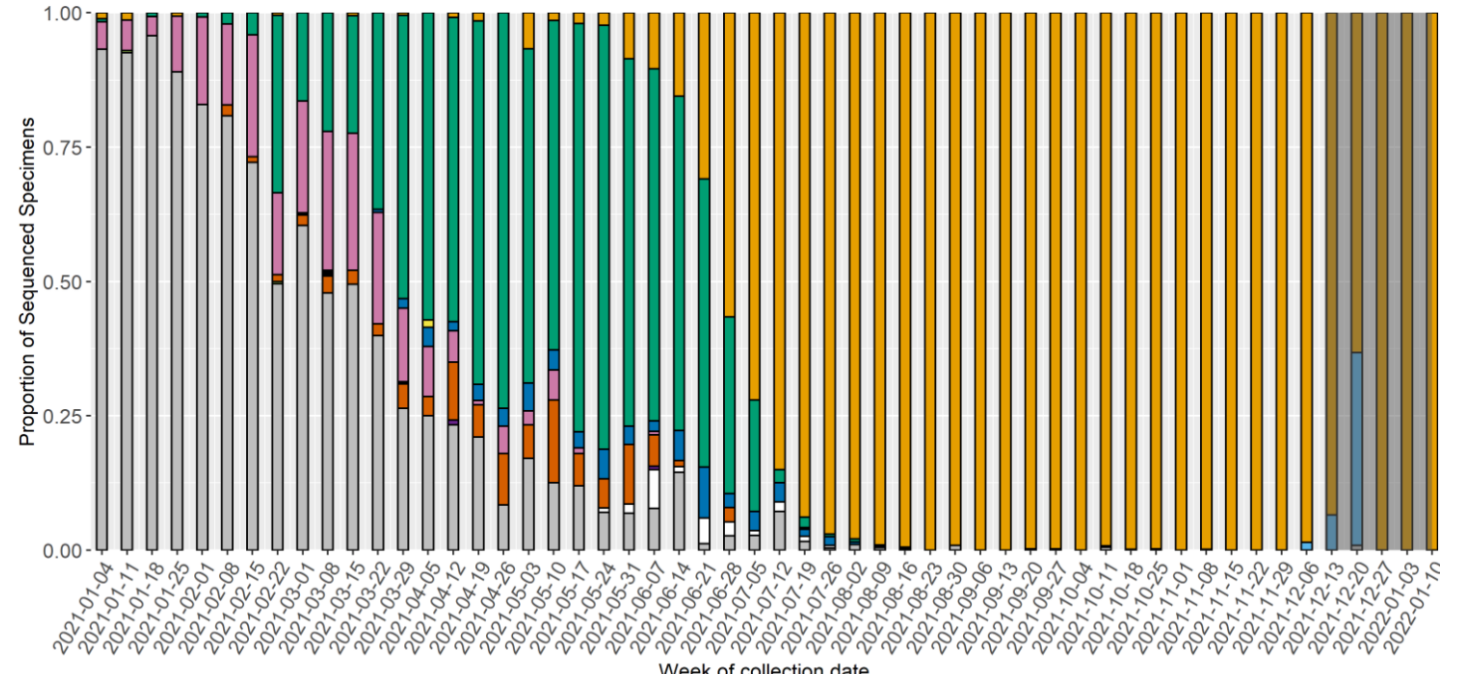
US Census Bureau reports 2097k people in New Mexico.

# Variant Monitoring: Omicron is the current variant

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



- New variants have appeared without evident intermediates. Need better global monitoring.
- Small number New Mexico statistics, likely all or nearly all B.1.1.529 in NM.
- Latest no-intermediate variant is B.1.1.529 (Omicron). Extremely rapid rise; faster than Δ. Viral evolution / immune evasion played a major role.
- If Omicron’s rise in New Mexico is slower than the national experience, this suggests (i) better infection control in New Mexico than nationally, and (ii) faster boosting.
- **Approximately 6-12 months is the longest variant-interval: D614G (~3 months), Alpha (~6-9 months), Delta (~6 months), Omicron (~6 months).**
- Updated mRNA vaccine from Pfizer in March 2022? Less than 6 months.



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

# Recent By-State Trends: Most Populous 10 States: True incidence?

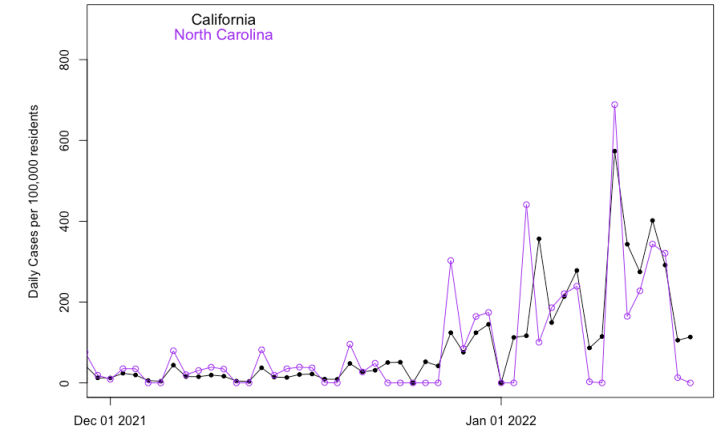
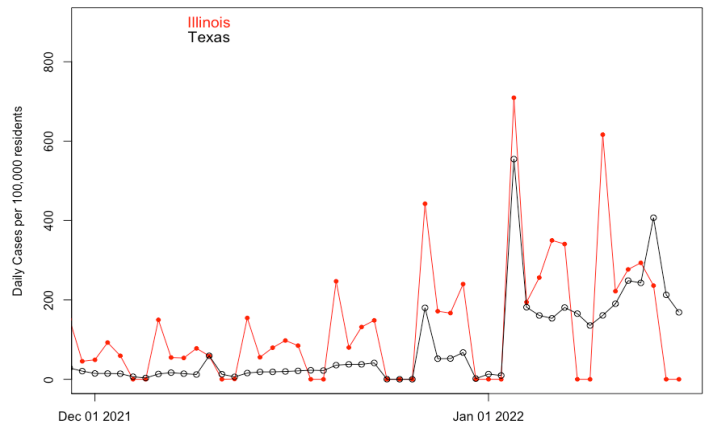
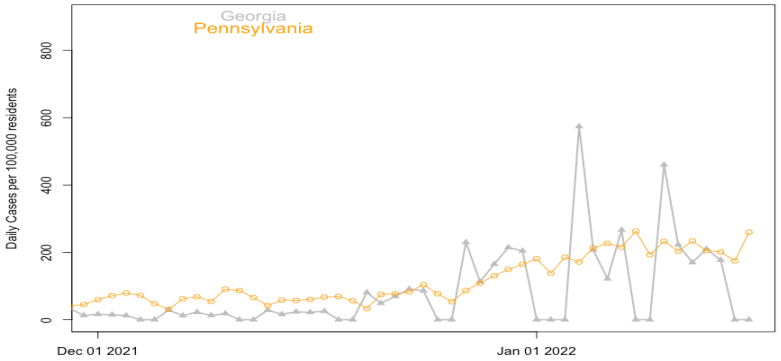
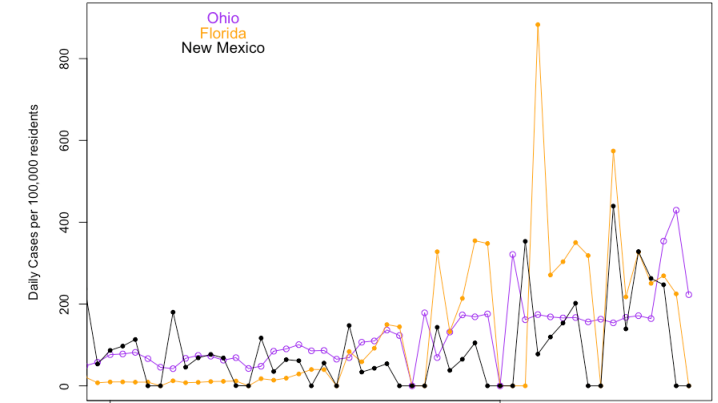
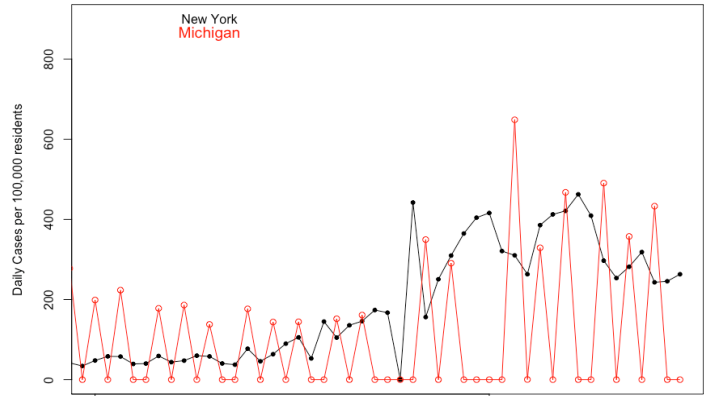
Trends over the last 3 weeks: **Increasing:** California, New Mexico, N. Carolina, Ohio\*, Texas\*. **Flat:** Florida?, Georgia, Illinois, Michigan, Pennsylvania. **Modest Decline:** New York.

**14-Day Testing positivity (CDC):** Red  $\geq 25\%$  positivity, Blue  $\geq 20\%$  &  $< 25\%$  positivity, Black  $> 15\%$  &  $< 20\%$  positivity, Orange No Data, uncounting may be possible at these levels of test positivity. Serosurvey, T-cell epitopes, etc.?

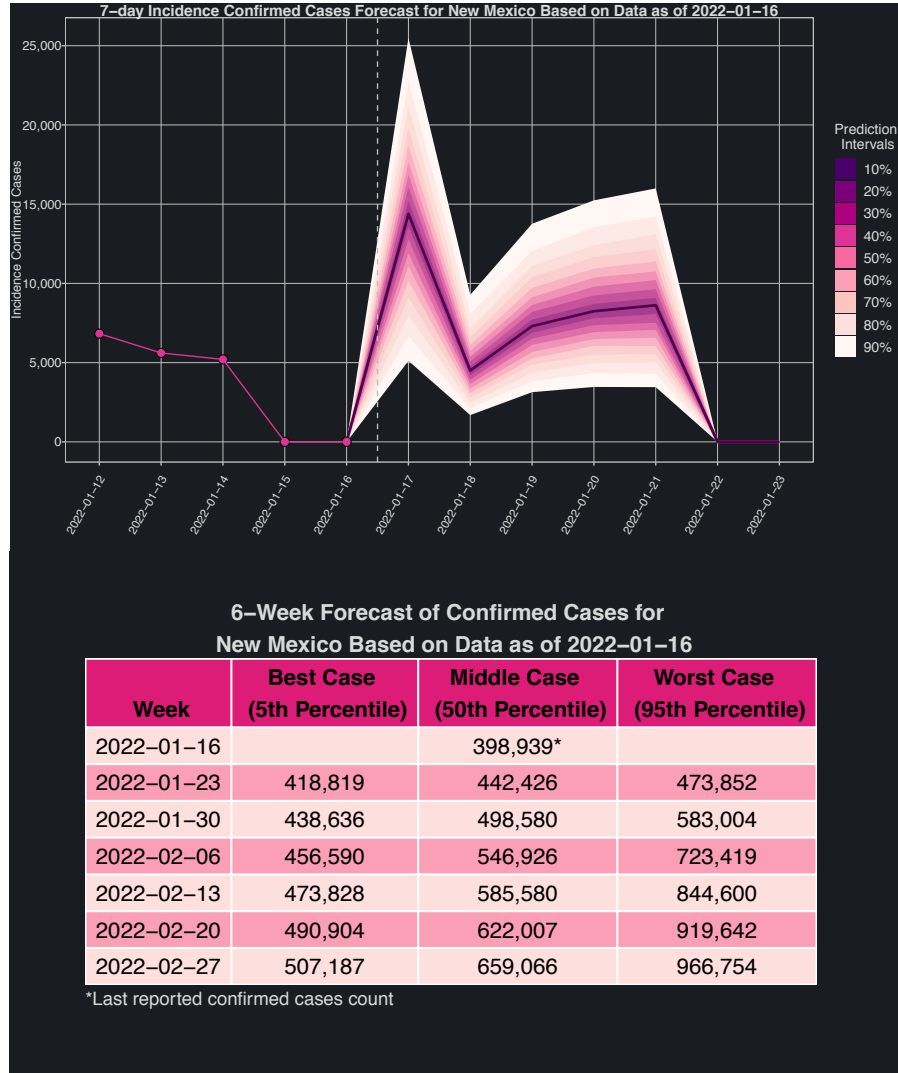
	Cases	Deaths
New York	271.73	0.862
Michigan	182.97	1.078
Ohio	237.65	1.037
Florida	266.15	0.306
New Mexico	202.42	1.099
Illinois	234.93	0.991
Texas	233.03	0.339
California	300.55	0.272
North Carolina	251.22	0.38
Georgia	177.16	0.323
Pennsylvania	215.88	1.064

\* = case report failed "heart-beat"

Daily rates per 100,000 residents averaged January 11<sup>th</sup> 2022 thru January 17<sup>th</sup> 2022.



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



**6-Week Forecast of Daily Average of Confirmed Cases for New Mexico Based on Data as of 2022-01-16**

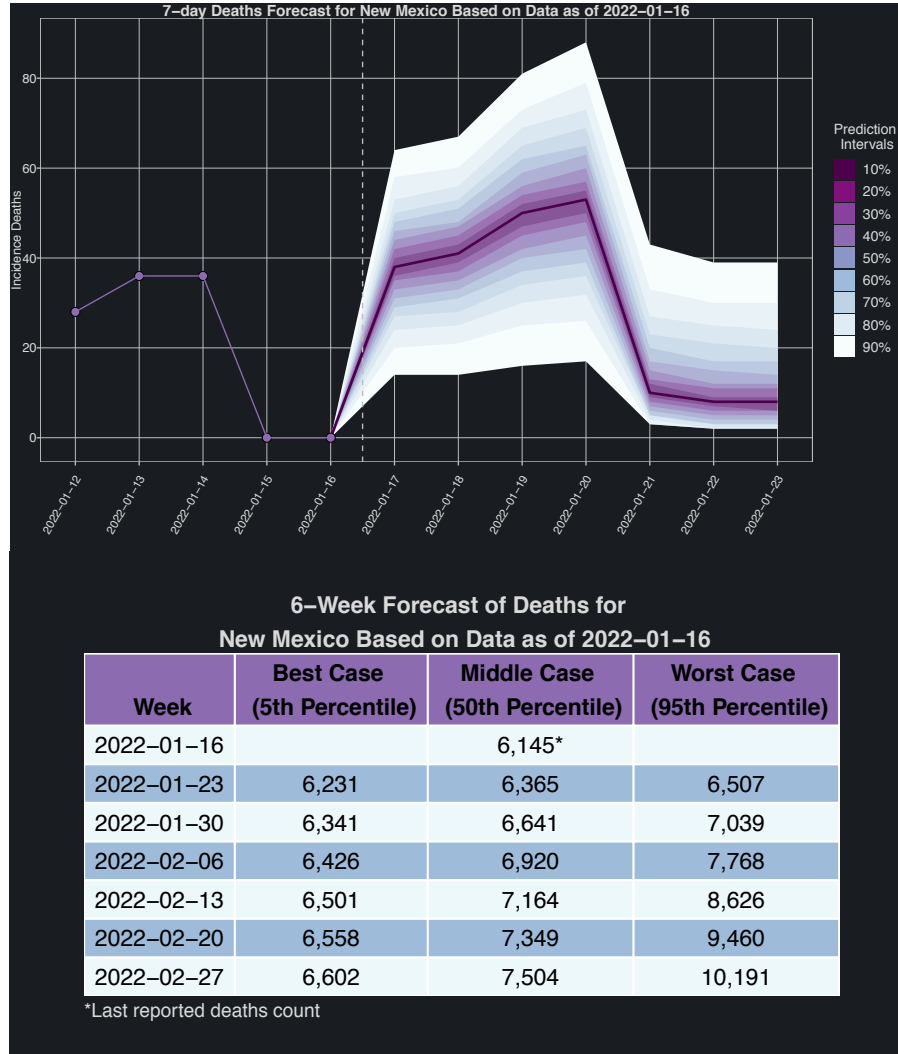
Week End Date	Best Case (5th Percentile)	Middle Case (50th Percentile)	Worst Case (95th Percentile)
2022-01-16		4,261*	
2022-01-23	2,408	6,151	11,396
2022-01-30	2,293	7,558	17,279
2022-02-06	2,197	6,393	21,982
2022-02-13	2,109	5,536	18,026
2022-02-20	1,958	4,989	11,419
2022-02-27	1,775	4,574	9,025

\*Last reported confirmed cases count

**So what?**

**Our model suggests that the number of daily cases is expected to range between 2400 and 9025 in the next few weeks**

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



6-Week Forecast of Daily Average of Deaths for New Mexico Based on Data as of 2022-01-16

Week Start Date	Best Case (5th Percentile)	Middle Case (50th Percentile)	Worst Case (95th Percentile)
2022-01-16		23*	
2022-01-23	10	30	60
2022-01-30	11	37	90
2022-02-06	9	37	122
2022-02-13	7	31	136
2022-02-20	5	25	130
2022-02-27	4	19	118

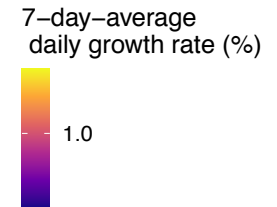
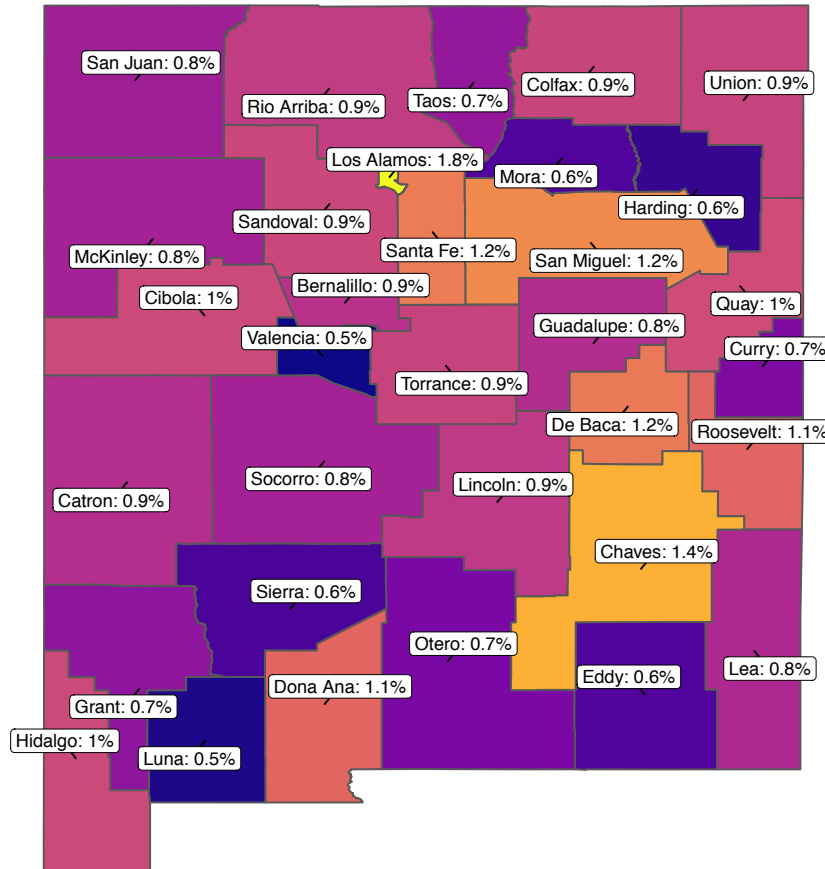
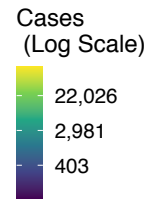
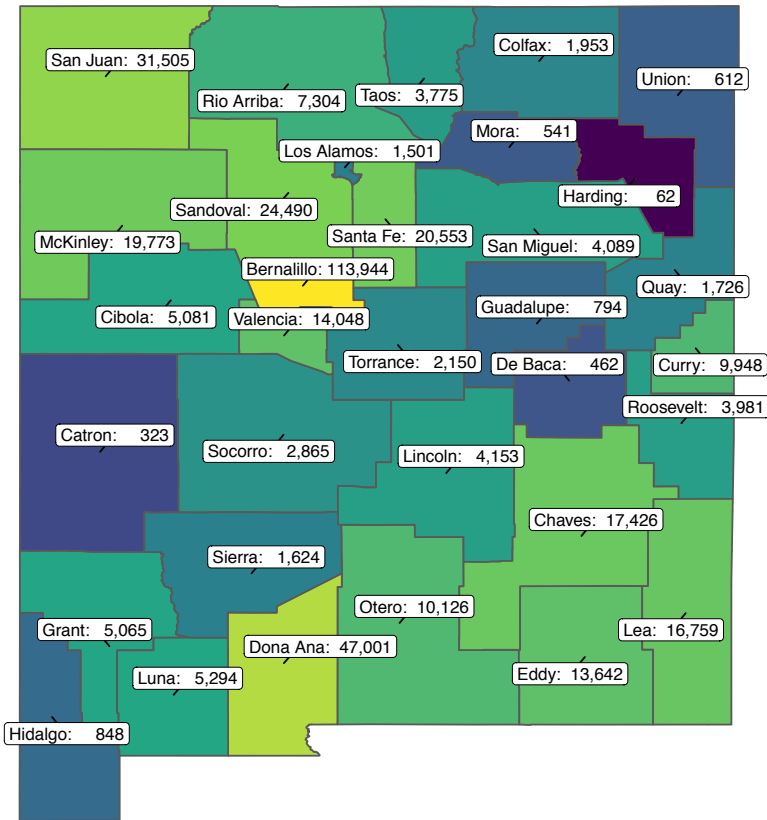
\*Last reported confirmed deaths

**So what?**

**Our model suggests that the number of daily deaths is expected to range between 10 and 120 in the next few weeks**



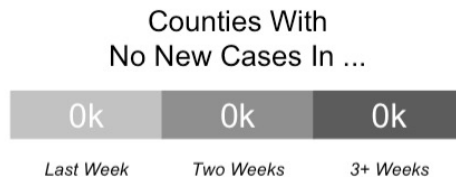
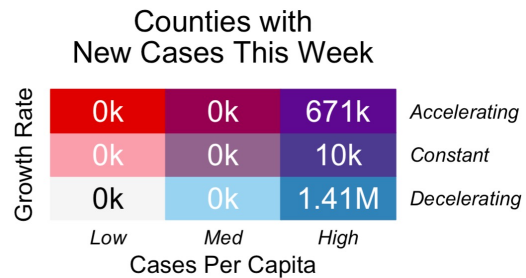
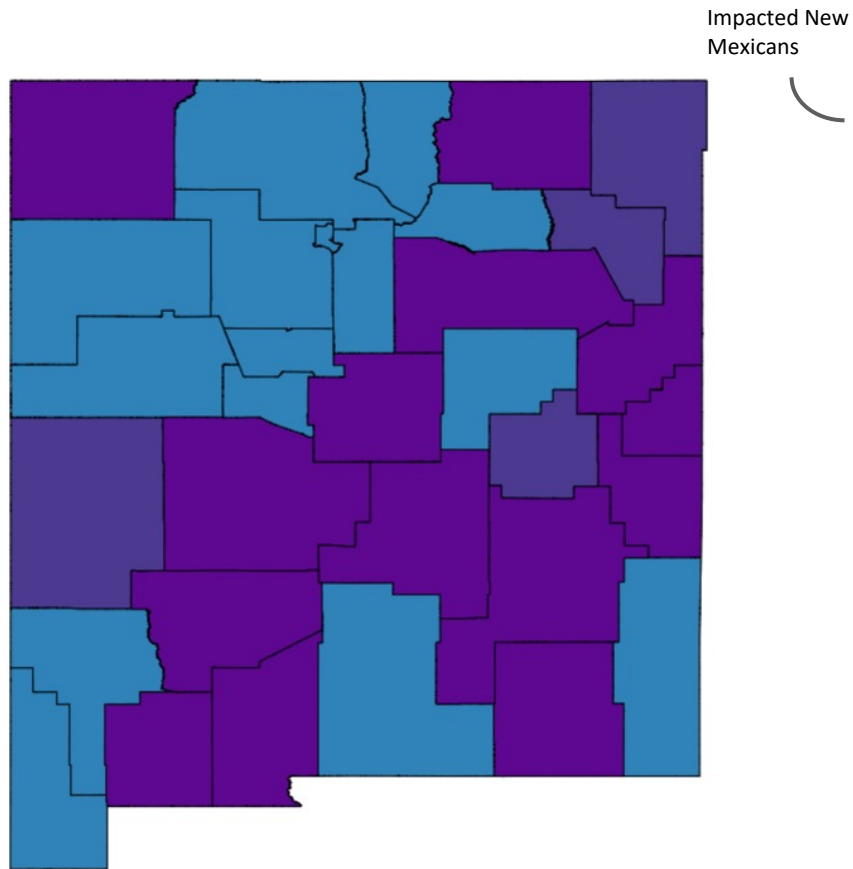
# Cumulative Cases & Daily Growth Rate for NM: Jan 16



Chaves, De Baca, Los Alamos, Santa Fe and San Miguel counties have the highest cumulative growth rates.

\*Growth rate is in cumulative cases

# Weekly Growth Rate for NM: Another View (Jan 16)



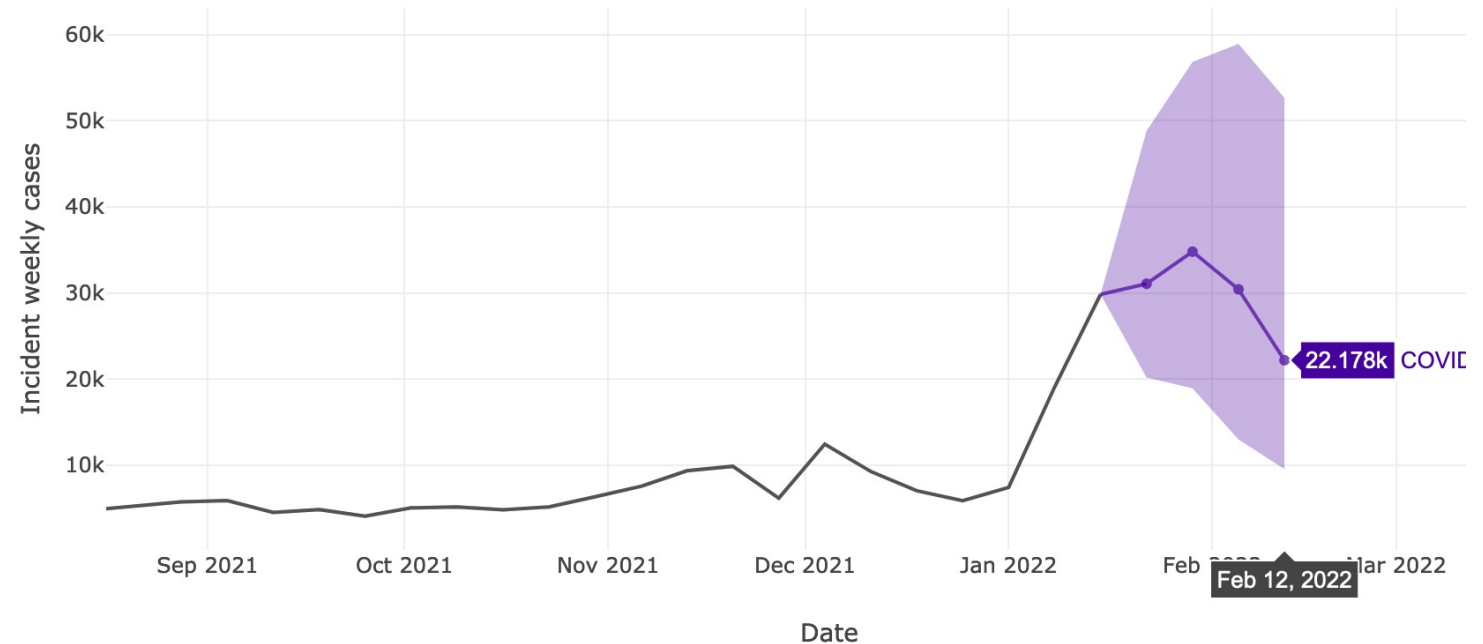
- ## So what?
- Most people in New Mexico are living in a county that has **high per-capita case counts and decelerating**

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

# Forecast for Incident Weekly Cases in NM

The CDC ForecastHub shows a 29% decrease from incident weekly cases observed at 29,826 (Jan 15) to 22,178 by Feb 12, 2021



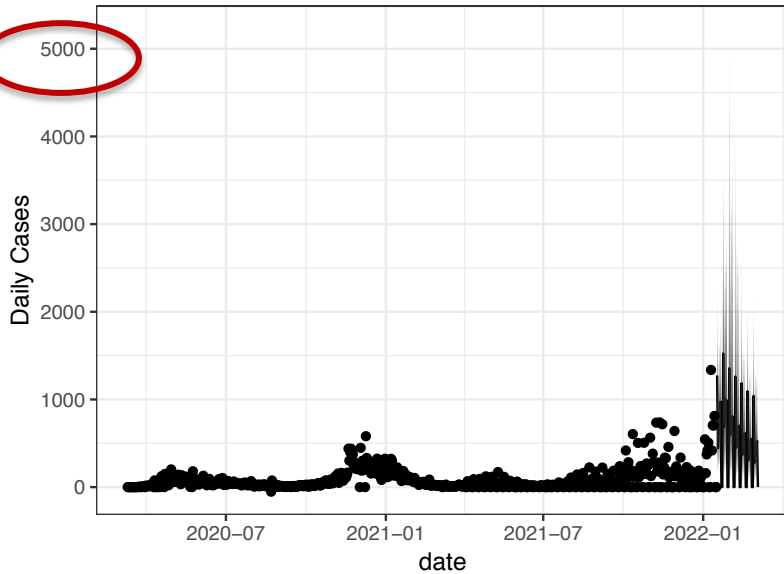
COVIDhub-4\_week\_ensemble prediction, COVID 19  
ForecastHub

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

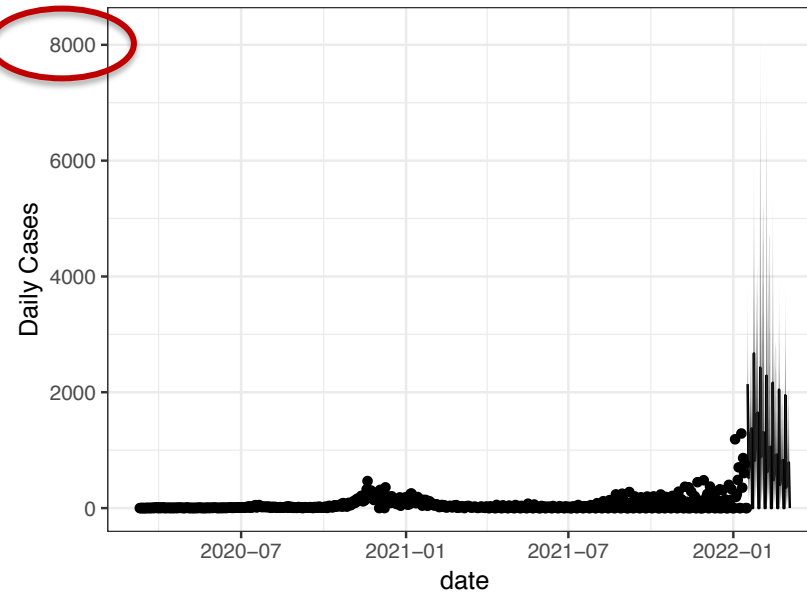
## > Additional Regional Forecasts

# Central & North Regions Daily Cases Forecast

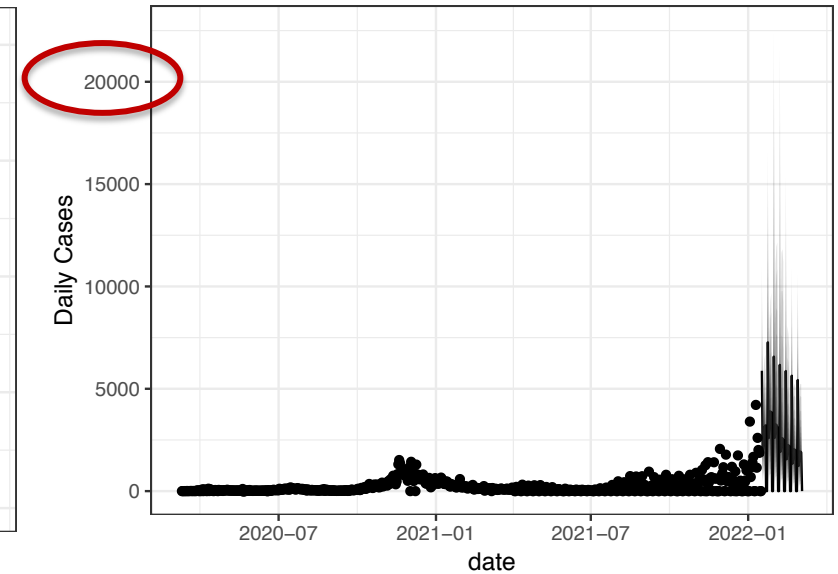
## Northwest



## Northeast



## Central

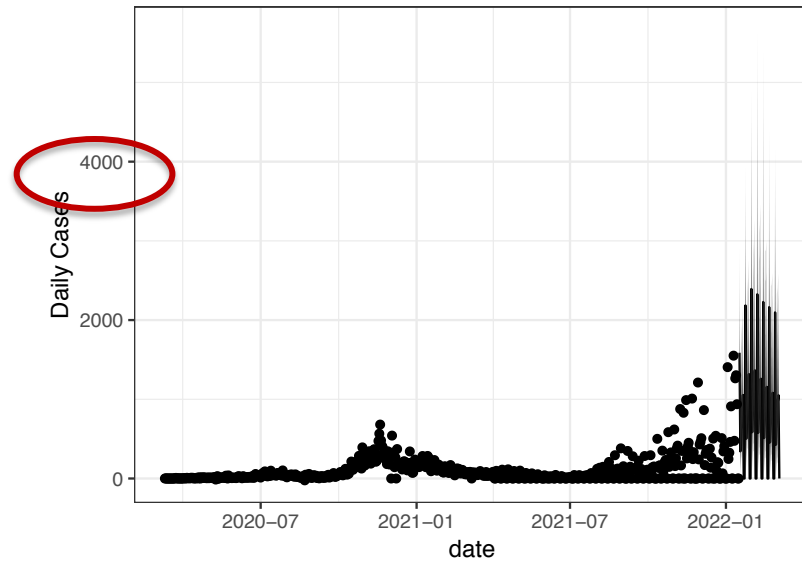


**So what?**

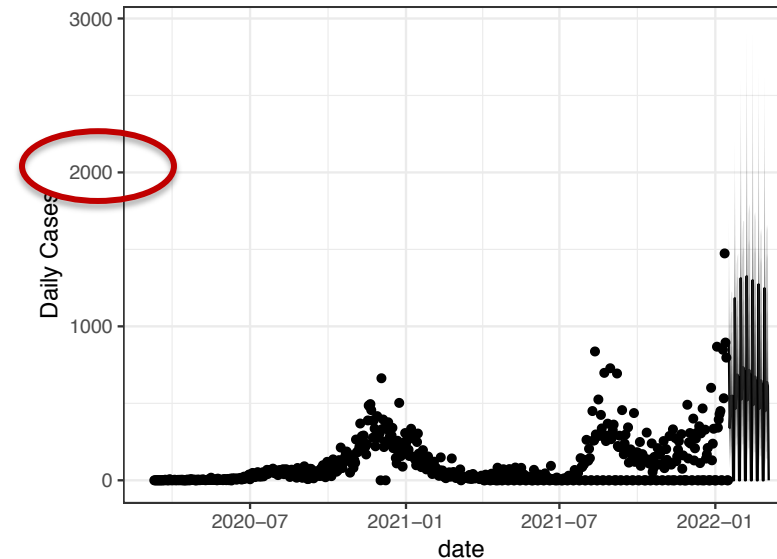
**Central and Northeast trending upward. The central region is expected to see the most number of cases followed by the northwest and northeast regions.**

# South Regions Daily Cases Forecast

## Southwest



## Southeast

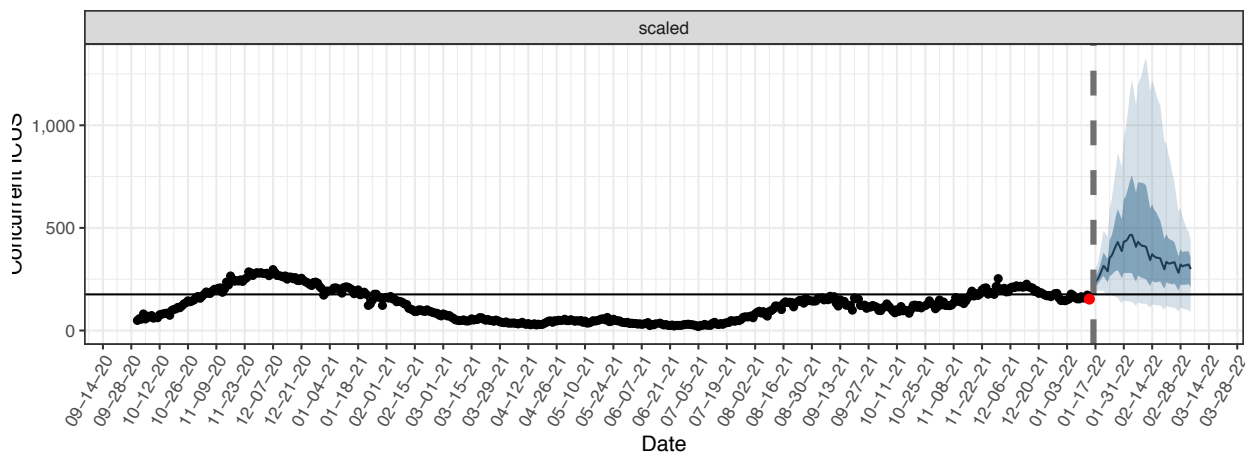
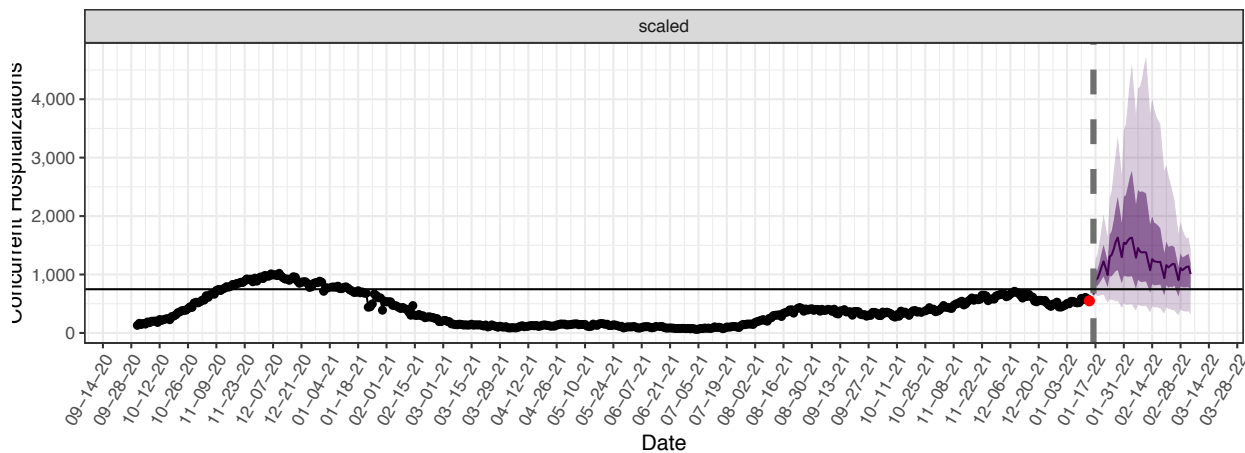


**So what?**

**Both regions trending upward. The southwest region is expected to see the most number of cases followed by the southeast region**

# > 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)
1/23/22	167	289	456
1/30/22	132	387	794
2/6/22	120	408	1097
2/13/22	112	343	1165
2/20/22	103	298	923
2/27/22	94	282	579

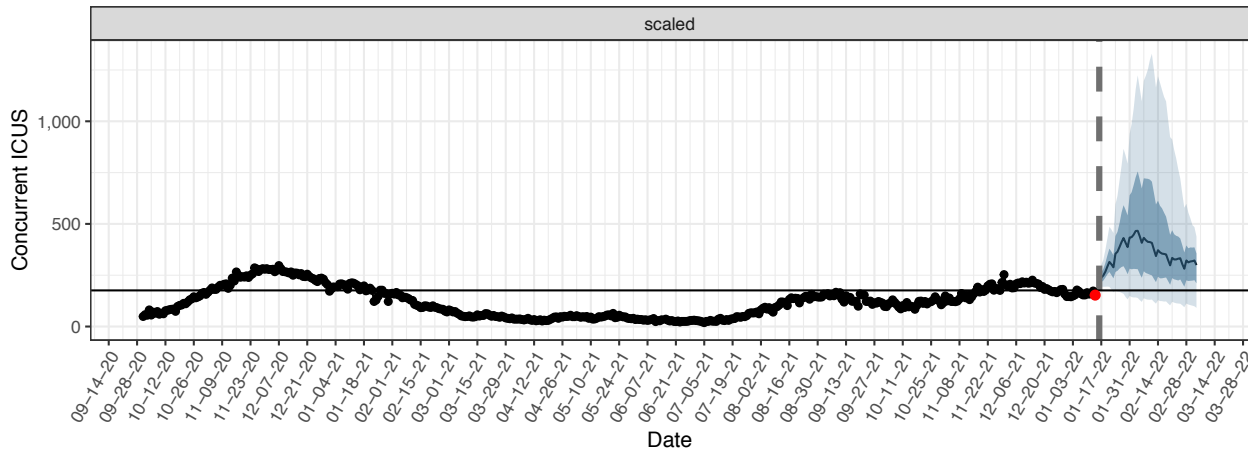
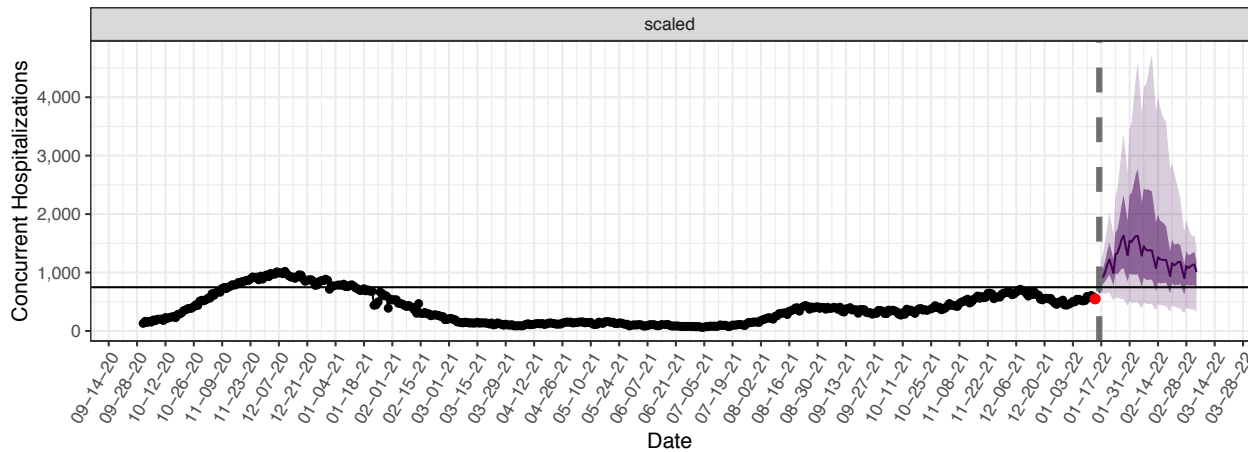
“Scaled” Scenario

So what?

Model is predicting an increase 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)
1/23/22	350	703	1187
1/30/22	297	910	1919
2/6/22	263	880	2642
2/13/22	241	730	2587
2/20/22	227	641	1851
2/27/22	206	621	1125

“Scaled” Scenario

So what?

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