Catron, Harding, Mora, Los Alamos, Grant, Otero, Cibola, and San Juan have elevated cumulative growth rates.
Weekly Growth Rate for NM: Another View (Oct 18)

So what?

- Bernalillo, Catron, Chaves, Cibola, Dona Ana, Eddy, Grant, Luna, McKinley, Rio Arriba, Sandoval, San Miguel, and Santa Fe are accelerating
- San Juan, Otero, Mora have higher per-capita cases
- 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
19 Oct 2021: EpiGrid modeling

- This model is *optimistic*. New Mexico has flat incidence.
- The fraction of individuals who isolate may be deteriorating (not timeliness for most who do isolate). This may be partly causative.
- Some large-population counties are deteriorating.
- NM daily deaths show a weak peak in September. A long tail of mortality into October is occurring. An transient increase in mortality is possible.
- Improved vaccination levels after 26 October are likely to improve the overall outlook, as will third doses.
A look at the raw incidence data

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

Cases rates are flat, or 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.
19 October 2021 Vaccine Analysis

- ~1426k first doses have been administered in NM.
- ~1258k completed vaccine series in NM.
- ~68.0% 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 ~ 79.5% of all eligible people are vaccinated.
- 5-11 year-old vaccinations are likely next week.

- A simple calculation of effective reproductive number for Delta variant with ~75% immune suggests “intrinsic” Re >~2.
- An effective reproductive number near 1 based solely on vaccination will not be achieved until >~80% vaccination of the total population.
- High adoption of third/months-spaced doses in vulnerable populations will lower mortality.
Variant Monitoring: Changing epidemic trends are not driven by variant replacement.

- B.1.617.2, “Δ”, ”Delta”, is the “Indian” variant.
- New variants have appeared without evident intermediates.
- *Low levels* of old variants often persist (the A-lineage and many others).
  
New Mexico’s data are consistent with Delta being dominant.
What is happening in the rest of the U.S.? The 10 most populous states and New Mexico


<table>
<thead>
<tr>
<th>Cases</th>
<th>Deaths</th>
</tr>
</thead>
<tbody>
<tr>
<td>New York</td>
<td>23.9</td>
</tr>
<tr>
<td>Michigan</td>
<td>43.76</td>
</tr>
<tr>
<td>Ohio</td>
<td>39.3</td>
</tr>
<tr>
<td>Florida</td>
<td>11.85</td>
</tr>
<tr>
<td>New Mexico</td>
<td>32.66</td>
</tr>
<tr>
<td>Illinois</td>
<td>18.02</td>
</tr>
<tr>
<td>Texas</td>
<td>20.01</td>
</tr>
<tr>
<td>California</td>
<td>13.82</td>
</tr>
<tr>
<td>North Carolina</td>
<td>29.06</td>
</tr>
<tr>
<td>Georgia</td>
<td>15.91</td>
</tr>
<tr>
<td>Pennsylvania</td>
<td>34.76</td>
</tr>
</tbody>
</table>

Daily rates per 100,000 residents averaged October 11th thru October 18th 2021.

* The suggestion has been made that cooler weather leads to people outside.
The relationship between vaccination and cases is strong and protective on a by-county basis.

Infection control *relative to vaccination rates*.
- San Juan County has very high incidence.
- Cibola, Grant, McKinley, Otero Counties are high.
- Chaves, Colfax, Lincoln, and Los Alamos Counties are marginally high compared with vaccination.
- Curry, Dona Ana, Lea, Luna, Roosevelt, and Socorro have better than typical incidence compared to vaccination.
- Roosevelt and Curry has 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.

Vaccination rates are uniformly low in: Quay, Lea, Eddy, Chaves, Torrance, Curry, Otero, and Roosevelt Counties. All have rates below ~40% of their *total* population.
- All counties have high absolute transmission, well above 10 per 10^5 per day.
- The current vaccination levels <80% of the total population are insufficient to prevent substantial, sustained transmission.
- The dotted line *still* points to roughly the most likely vaccination level that will give lower-level endemic transmission, while also reducing the heavy burden on hospitals. This is >~90% of the total population.
- Current vaccine effectiveness of ~90% will not support herd immunity, but may support future “super-immunity”.
- November 22nd is the federal deadline for full vaccination.
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:** Chaves, Curry.

- **Counties with slowly falling incidence:** Lea, Cibola.

- **Counties with steady incidence:** Bernalillo, Catron, Colfax, De Baca, Dona Ana, Eddy, Guadalupe, Harding, Hidalgo, Lincoln, Los Alamos, Luna, McKinley, Quay, Rio Arriba, Roosevelt, Sandoval, Santa Fe, San Miguel, Sierra, Socorro, Taos, Torrance, Union, Valencia.

- **Counties with rising incidence:** Grant, Mora, Otero, San Juan.

Statewide by-county incidence trends are heterogeneous, with few areas of good control, some counties with poor control, and most in an unstable intermediate range.

Need a population-wide understanding of what makes good infection control. The Delta variant is sufficiently contagious that people will have to re-learn what constitutes good infection control because lessons learned for the Alpha variant are no longer correct.