

# **COVID-19 Modeling**

## **August 17, 2021**

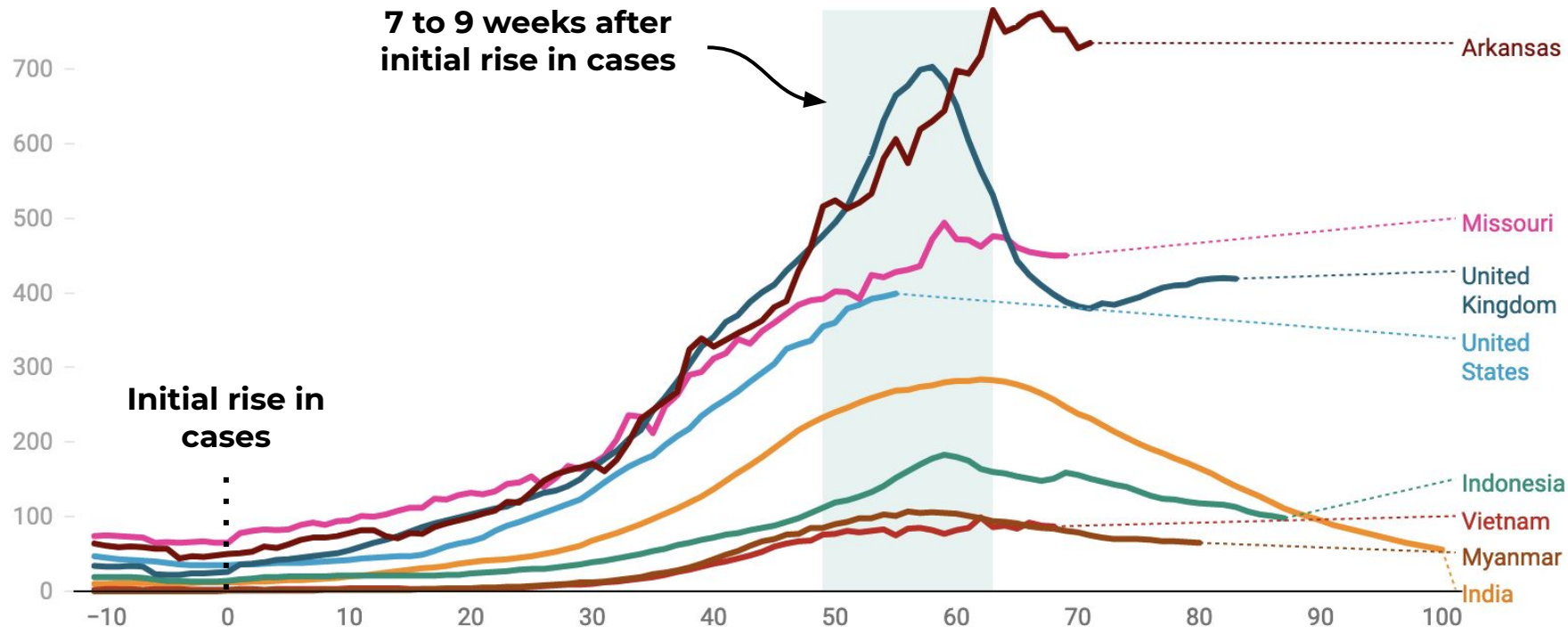
Presentation available at:  
[dfr.vermont.gov](https://dfr.vermont.gov)

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# Delta Variant Driven Peaks Across the Globe

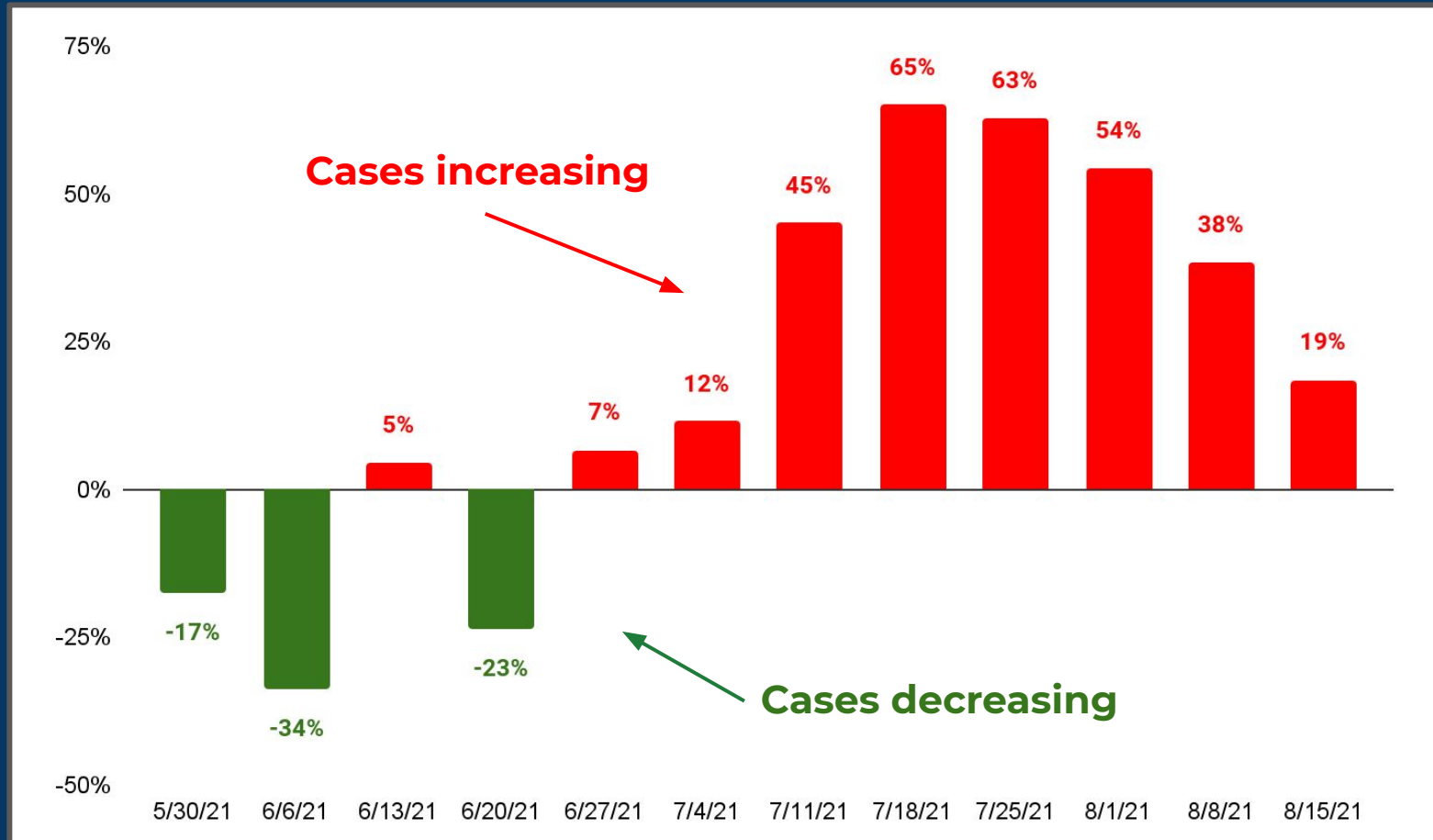
Day 0 is set to correspond with the beginning of a jurisdiction's case growth.



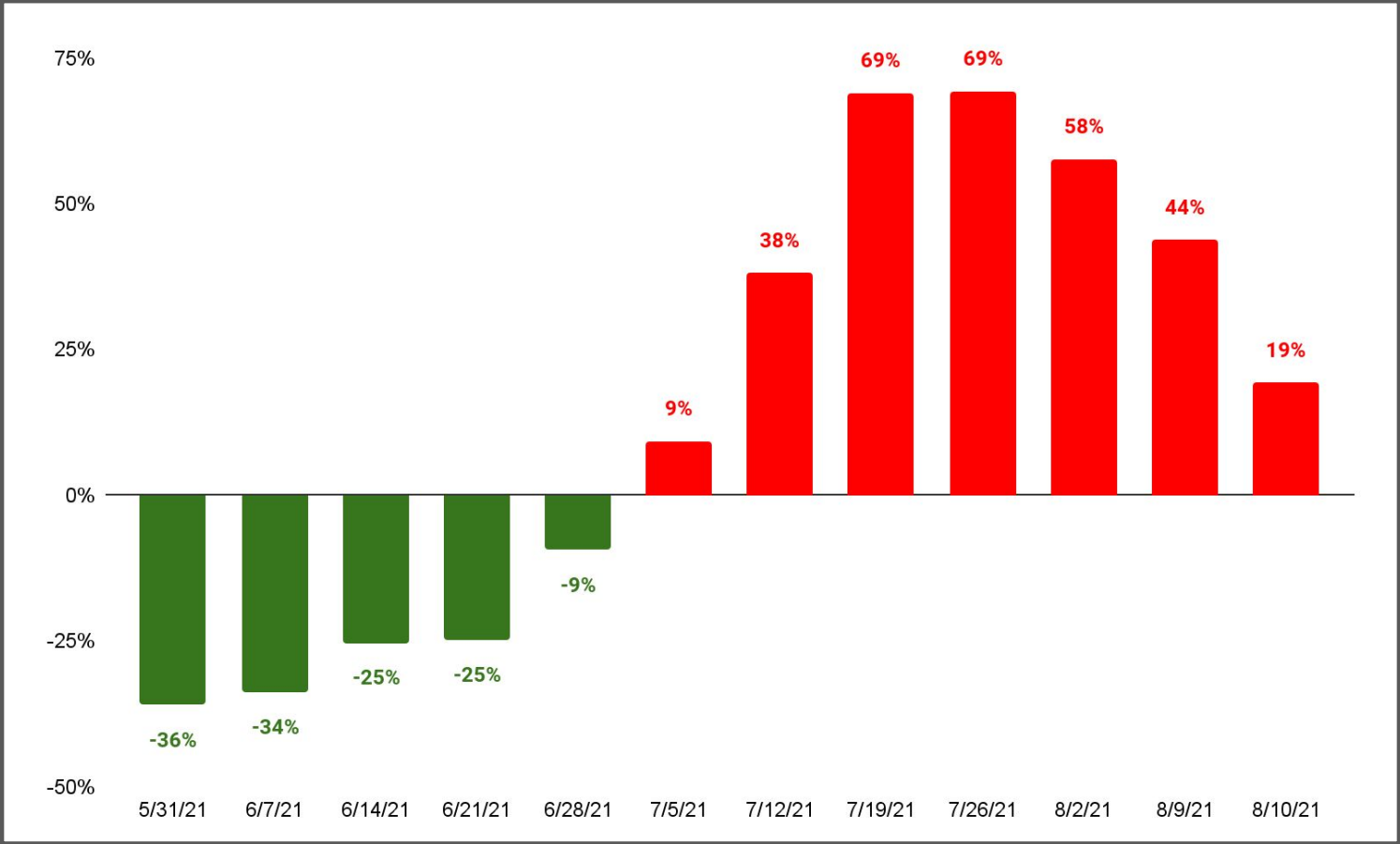
COVID-19 infections per million (7-day averages)

Source: CDC and Our World in Data

# Change in National Weekly Case Growth

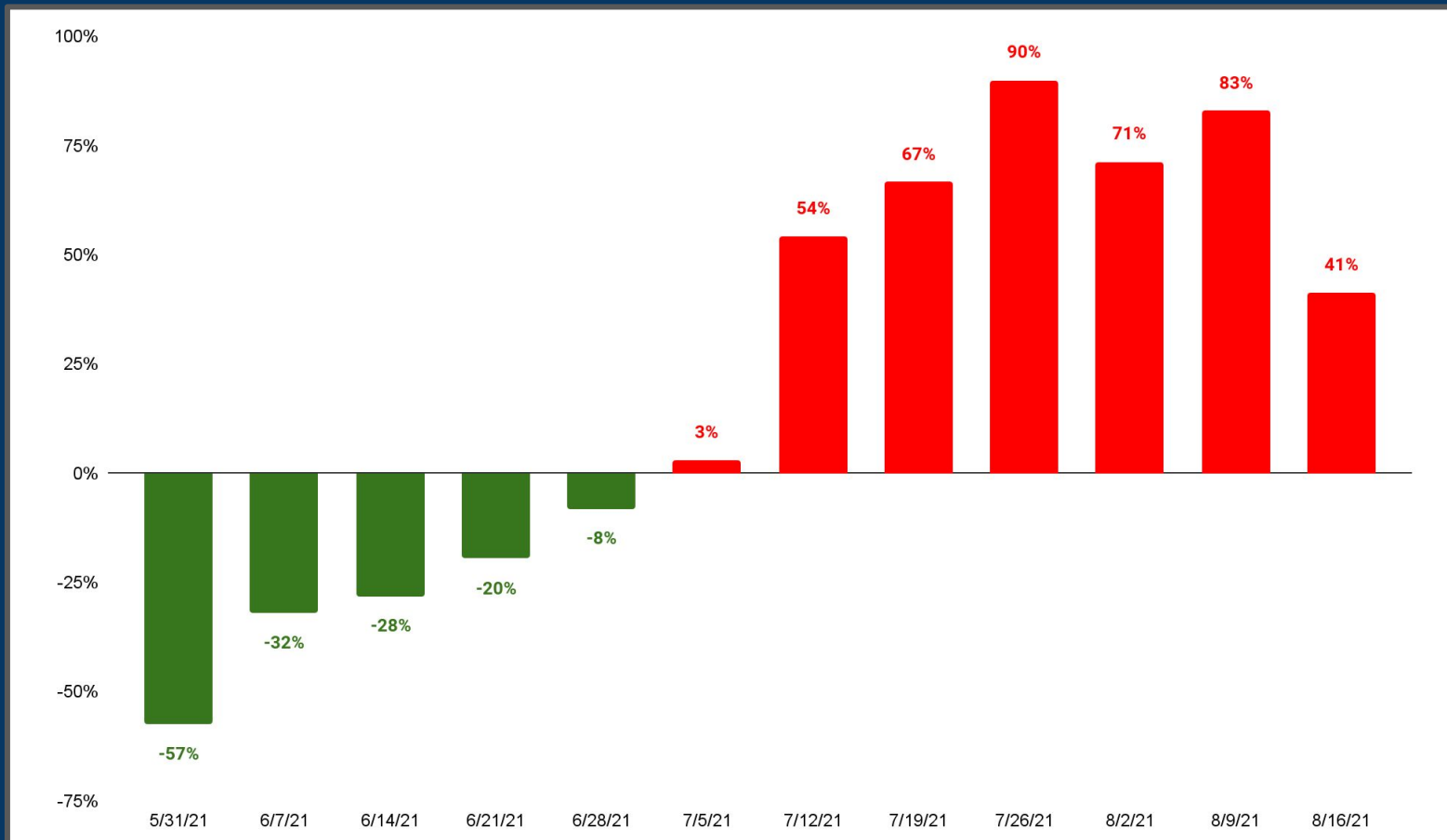


# Change in Northeast Regional Weekly Case Growth



Source: State Health Departments & CTV National News (Quebec)

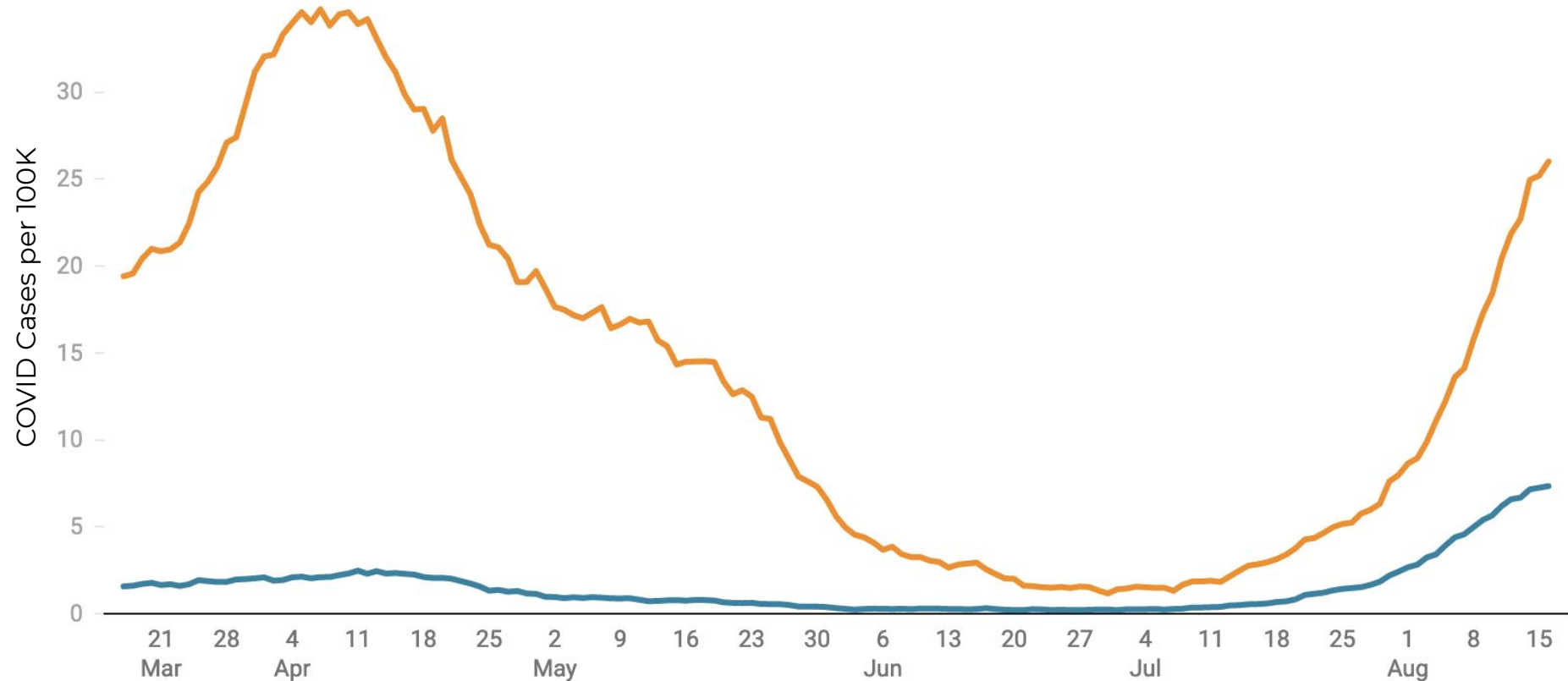
# Change in Vermont Weekly Case Growth



# Vermont Case Data

# Vermont COVID-19 Cases per 100K (14-Day Average)

Among Not Fully Vaccinated    Among Fully Vaccinated



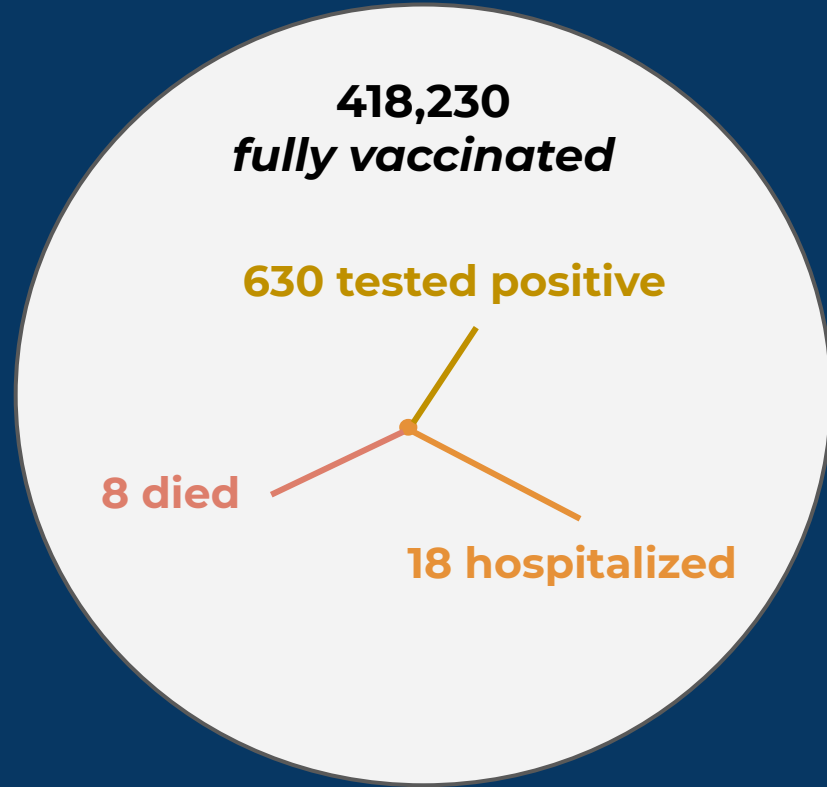


# Covid-19 Among Fully Vaccinated People in Vermont

*From January 1, 2021 to August 13, 2021*

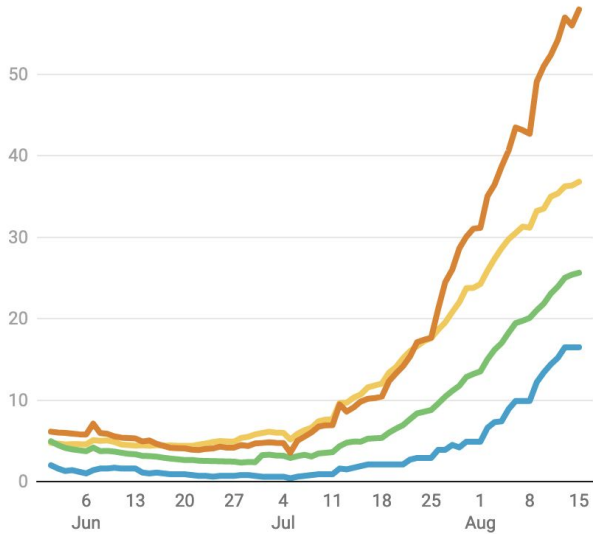
Of 418,230 **Fully Vaccinated** Vermonters:

- **630 tested positive (.15%)**
- **18 hospitalized for Covid-19 (.004%)**
- **8 died due to Covid-19 (.002%)**

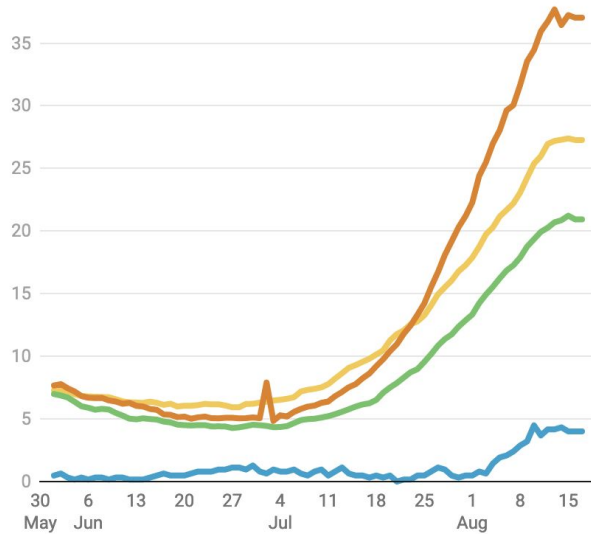


# Infections, Hospitalizations, & Deaths by Percentage of State Population Vaccinated

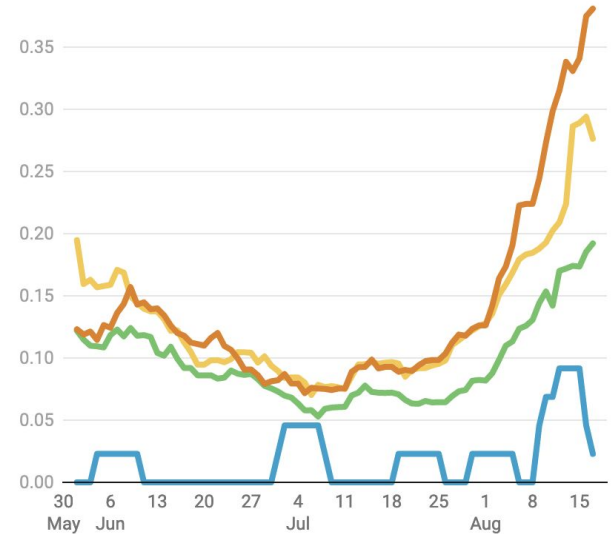
■ <40% Started Vaccination  
 ■ 40-60% Started Vaccination  
 ■ 60%+ Started Vaccination  
 ■ Vermont



Infections per 100K



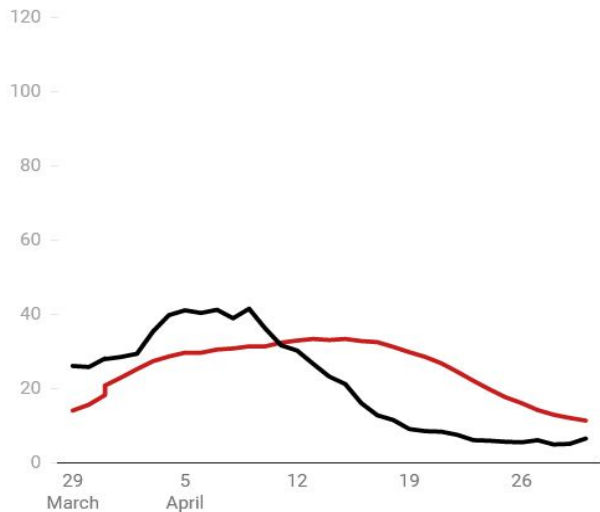
Hospitalizations per 100K



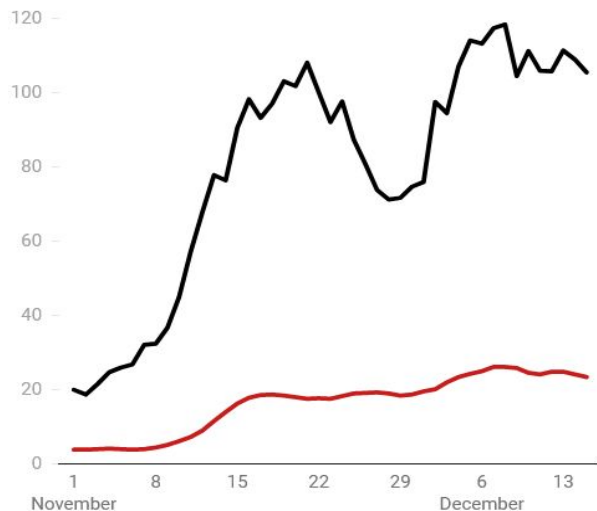
Deaths per 100K

# Comparing Vermont Case Increases with Hospitalizations

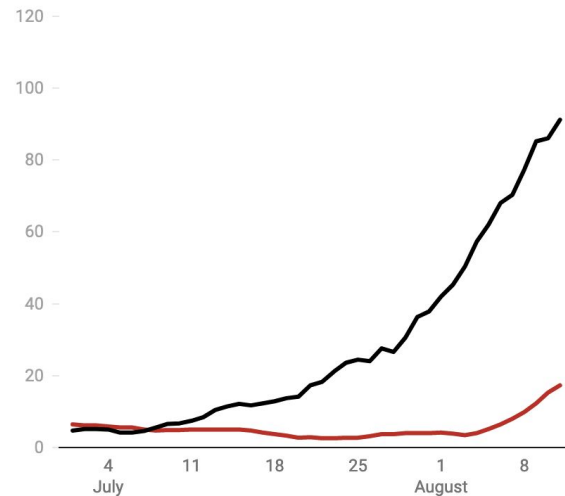
— Cases (7-Day Average)    — Hospitalizations (7-Day Average)



**Initial Case Increase**  
(March 29, 2020 to April 30, 2020)

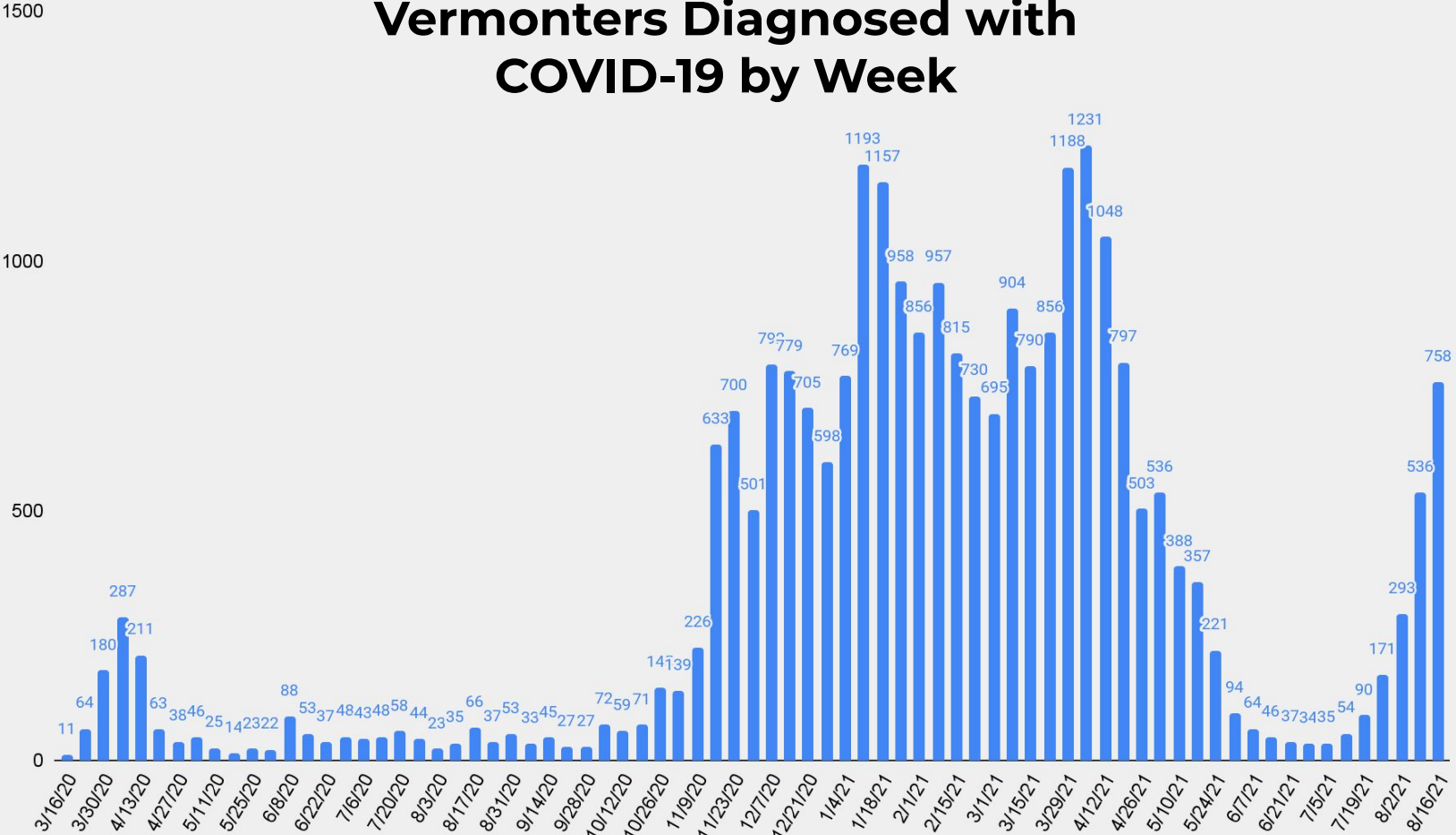


**Winter Case Increase**  
(November 1, 2020 to December 15, 2020)



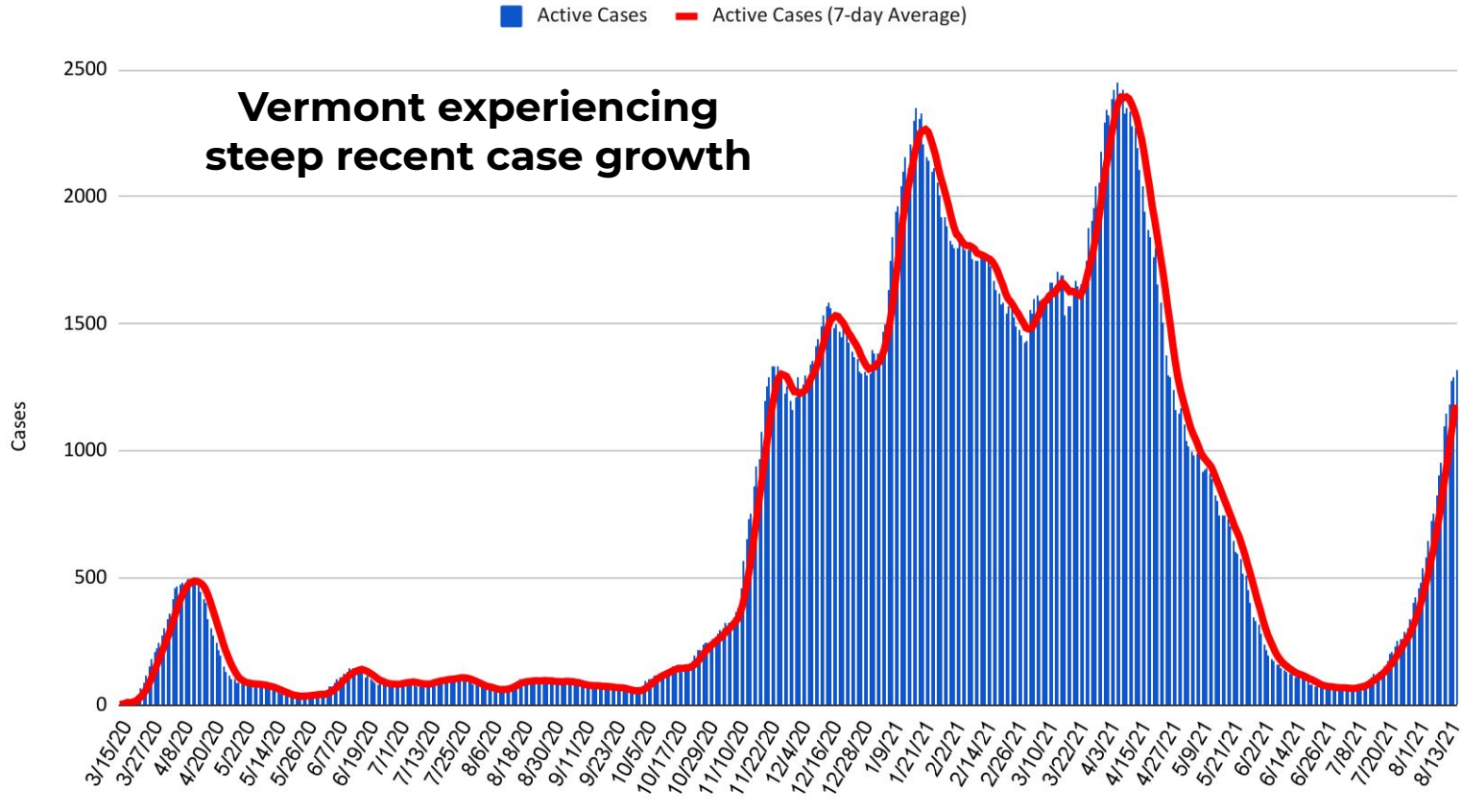
**Current Case Increase**  
(July 1, 2021 to August 9, 2021)

# Vermonters Diagnosed with COVID-19 by Week



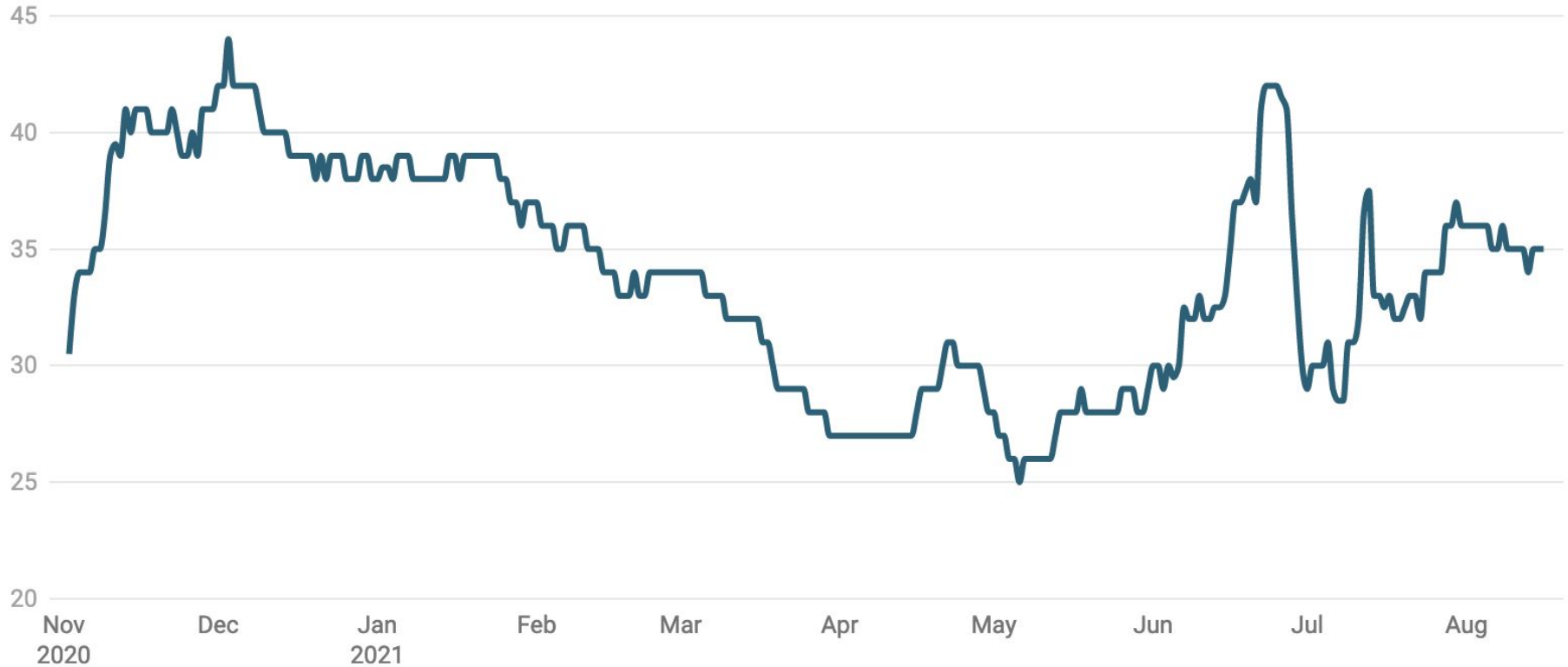
Source: Vermont Department of Health (week calculated as Tuesday to Monday)

## Estimated Active Cases of COVID-19 in Vermont



# Age of Infected Vermonters

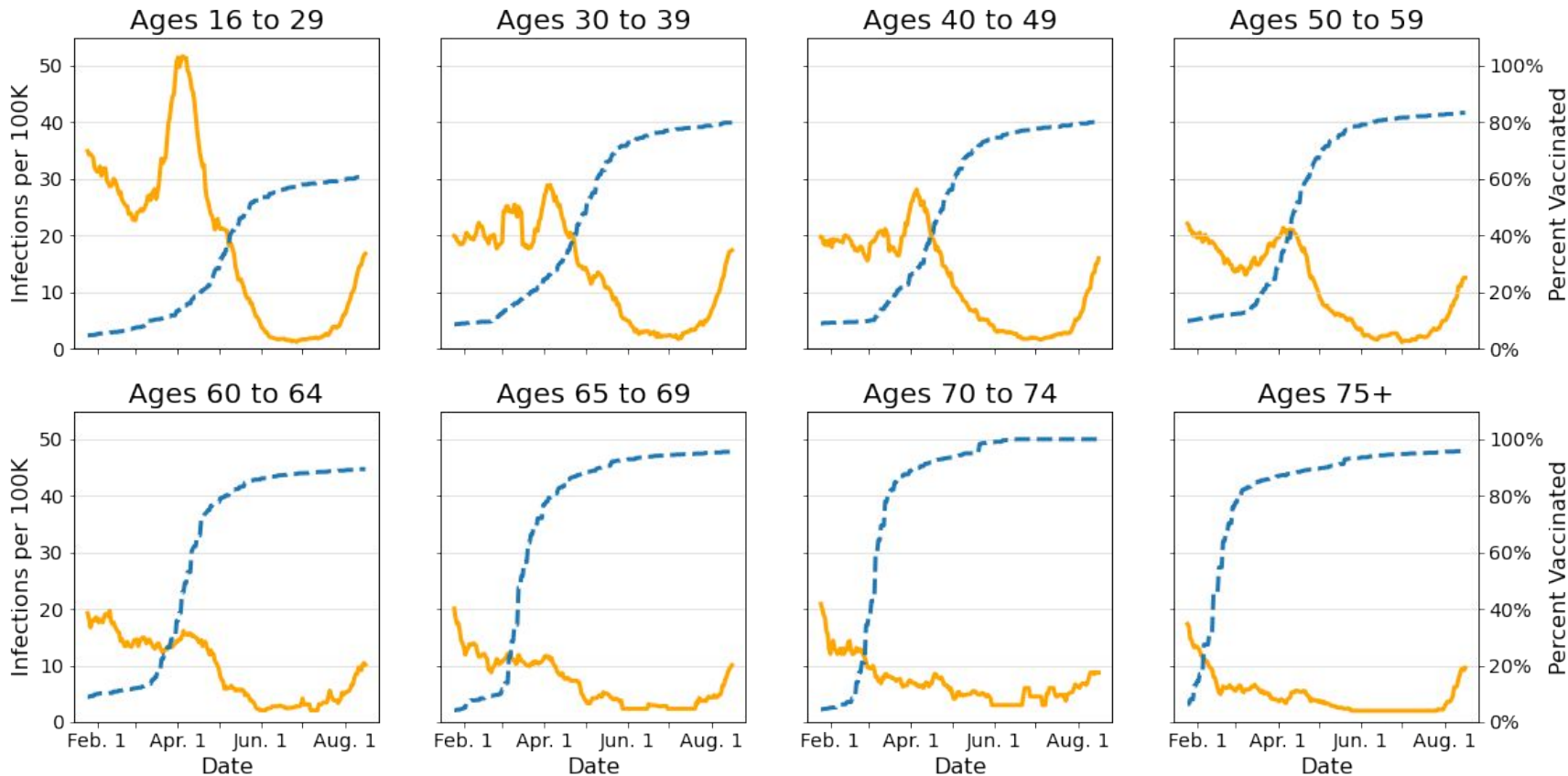
Median age of COVID positive individuals in VT over the last 14 days.



# Vermont Case Rate & Vaccination by Age Band

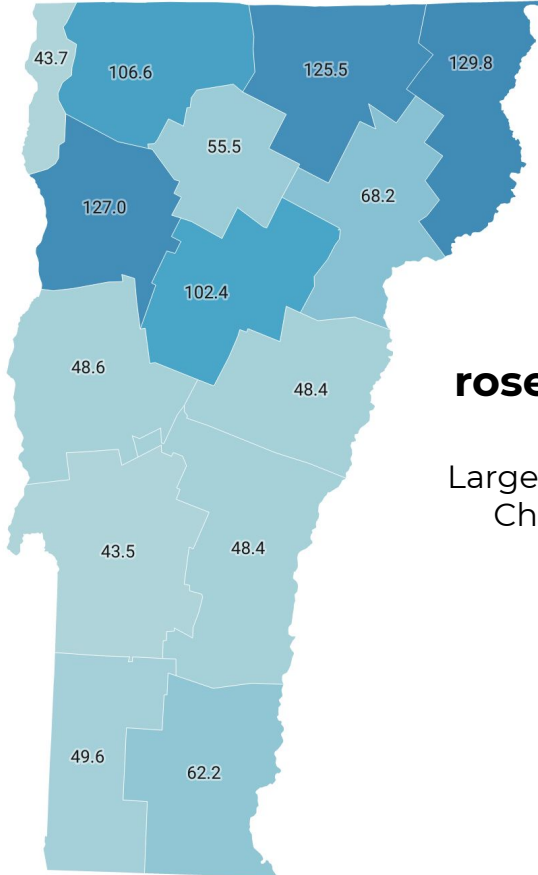
— New Infections per 100K (14-Day Average)

- - - Percent Received First Vaccine Dose



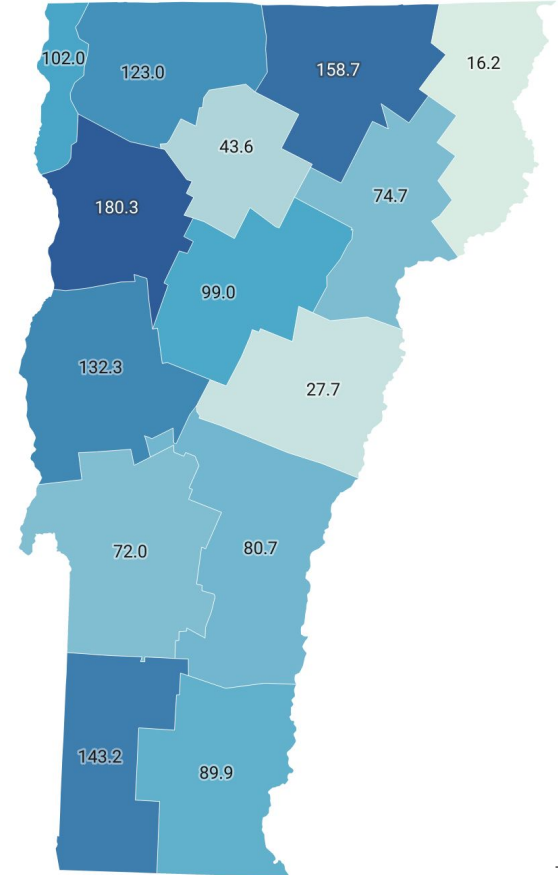
# Vermont Weekly Cases by County (per 100,000)

Results Reported August 4 to 10



# Vermont Weekly Cases by County (per 100,000)

Results Reported August 11 to 17



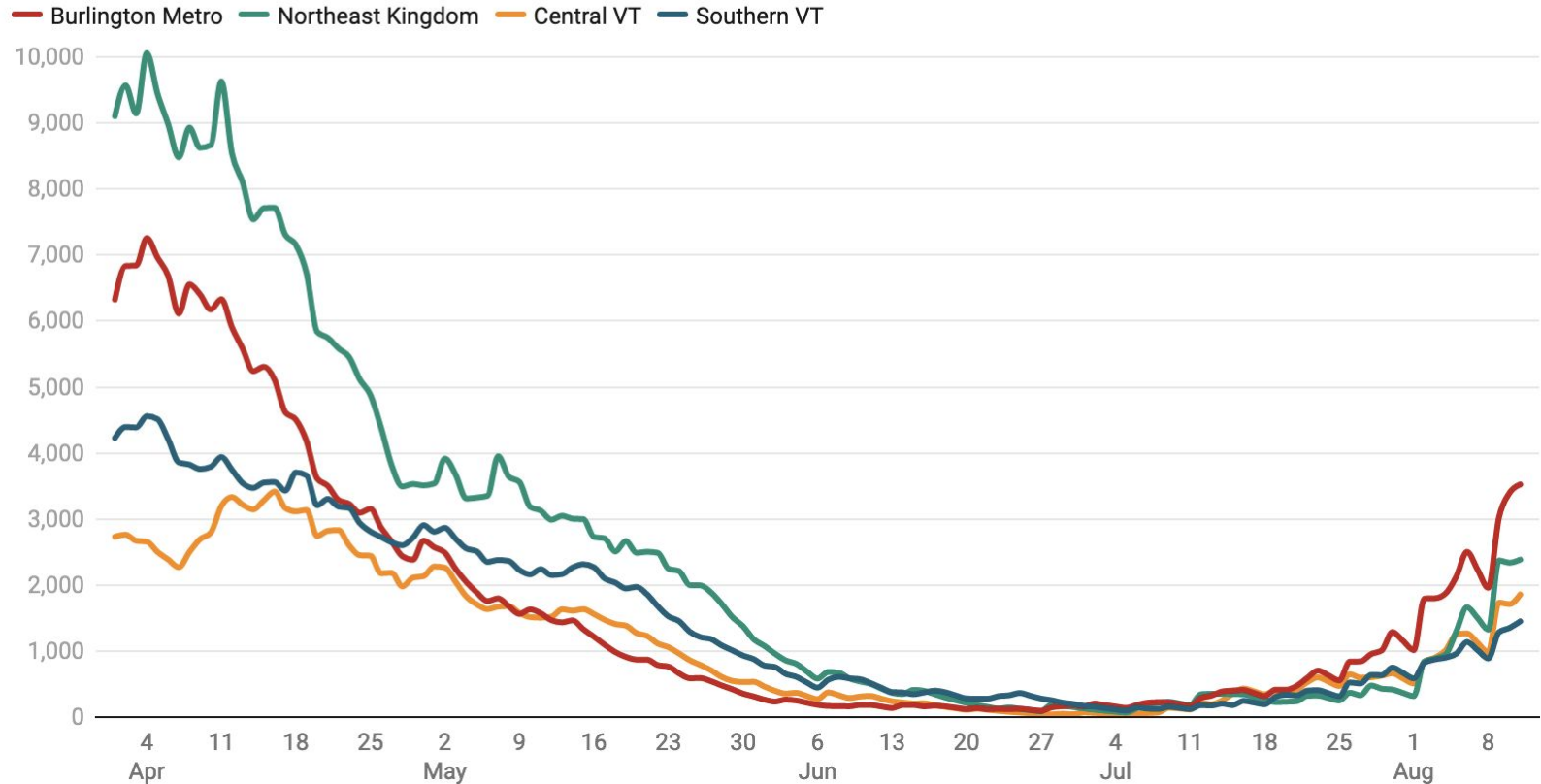
Covid-19 case rates  
**rose 41 percent** this past week

Largest increases in Addison, Bennington,  
Chittenden, and Grand Isle Counties

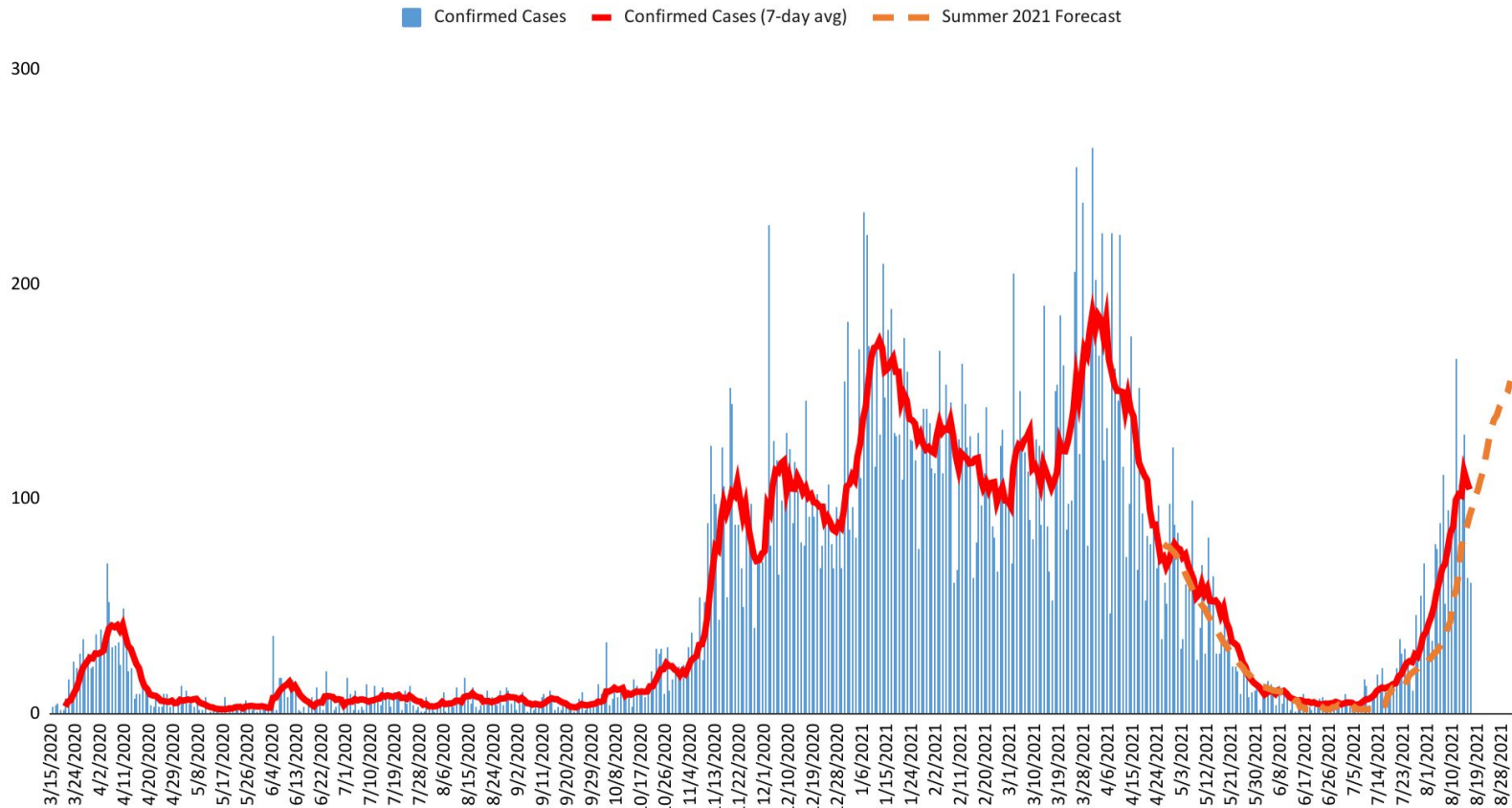


# Active COVID Cases per Million in Vermont Regions

For the purpose of this analysis, Vermont has been split into four regions: **Burlington Metro** (Chittenden, Franklin, Grand Isle), **Northeast Kingdom** (Caledonia, Orleans, Essex), **Central** (Lamoille, Washington, Addison, Orange), and **Southern** (Rutland, Windsor, Bennington, Windham).

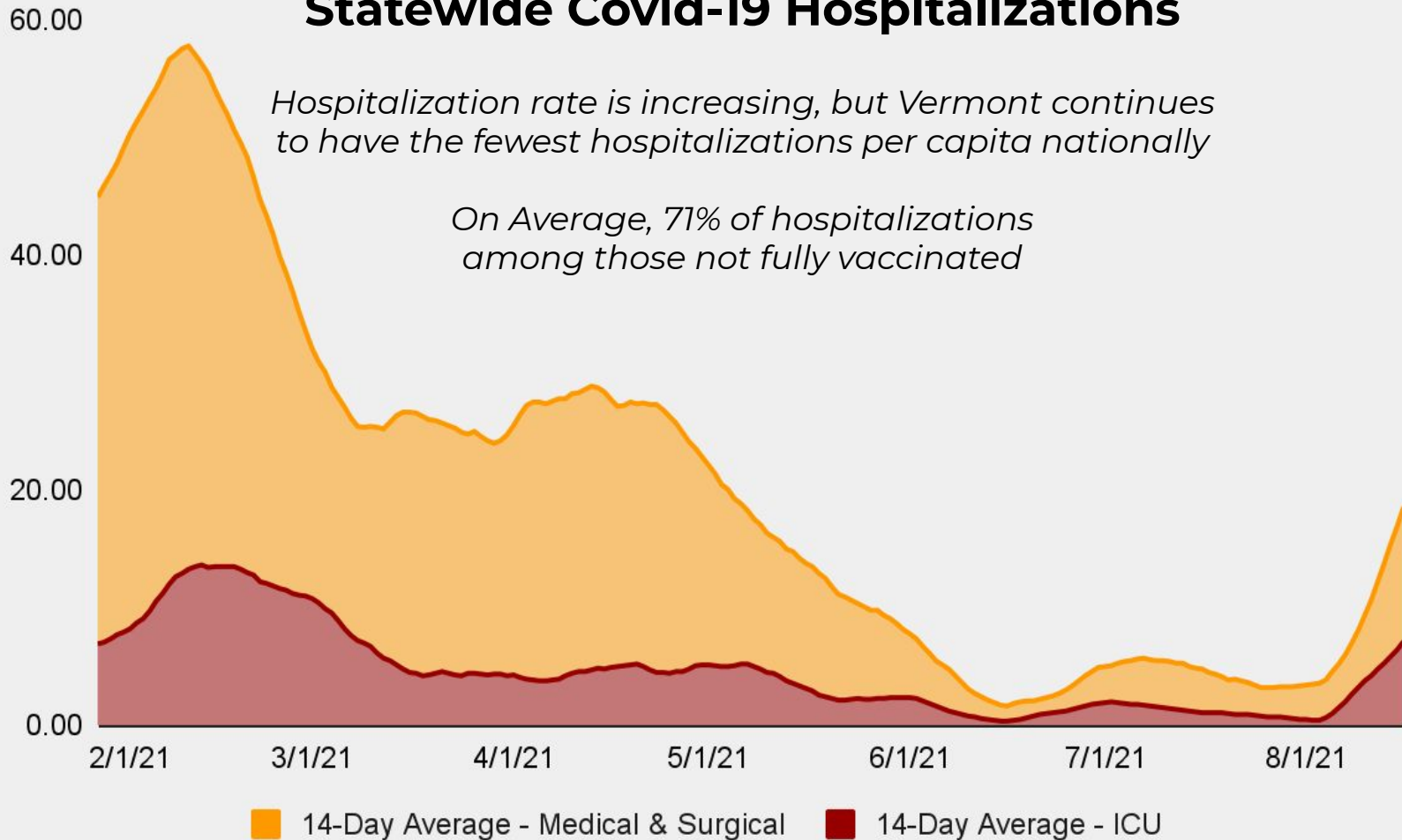


# Vermont Forecast



# Vermont Hospitalization Data

# Statewide Covid-19 Hospitalizations



Source: Vermont Department of Health—August 16, 2021

# Vermont Fatality Data

# Vermont Covid-19 Deaths by Week

30

20

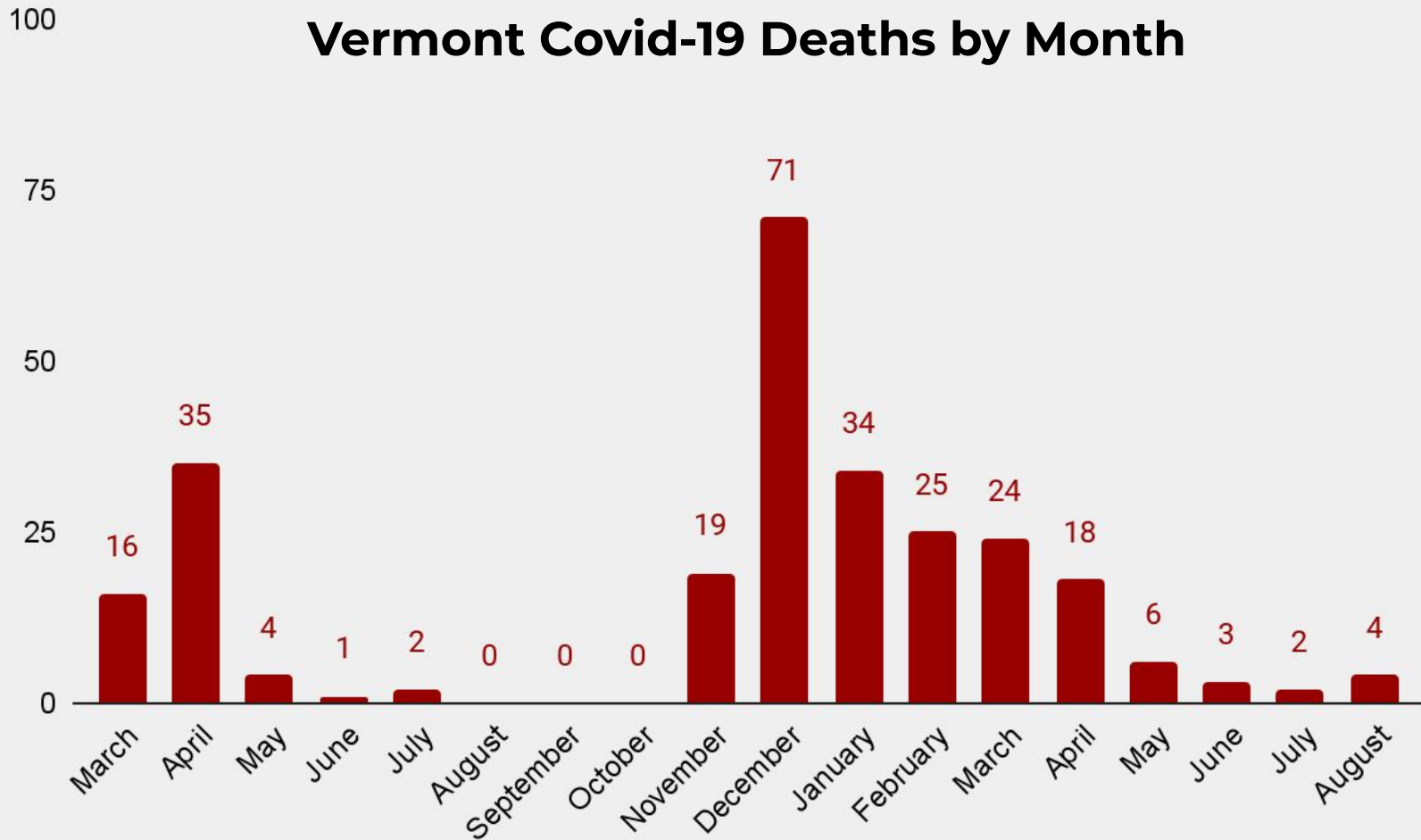
10

0



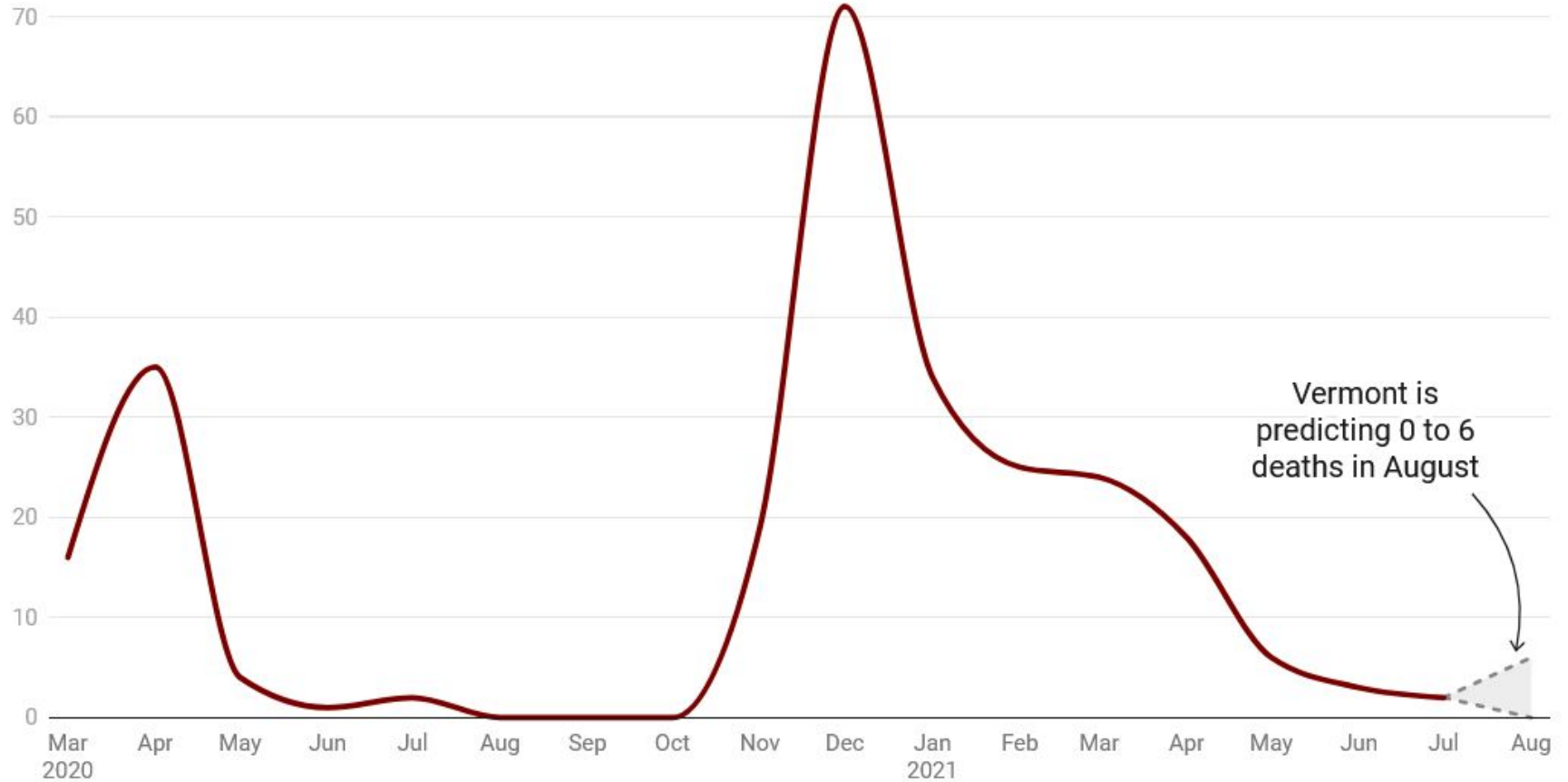
Source: Vermont Department of Health—August 17, 2021 (week ending)

# Vermont Covid-19 Deaths by Month



Source: Vermont Department of Health—August 16, 2021; deaths attributed to month in which death occurred rather than reported

# Vermont COVID-19 Deaths by Month

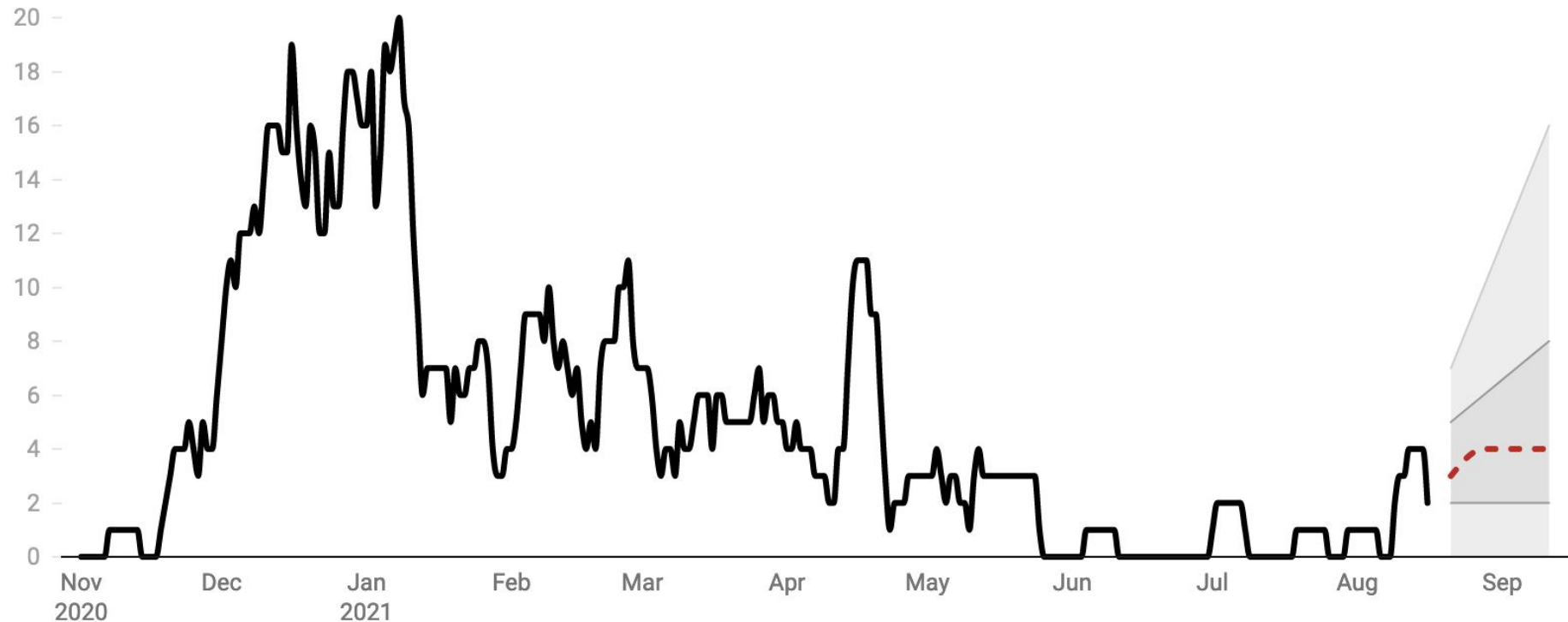


Vermont is predicting 0 to 6 deaths in August

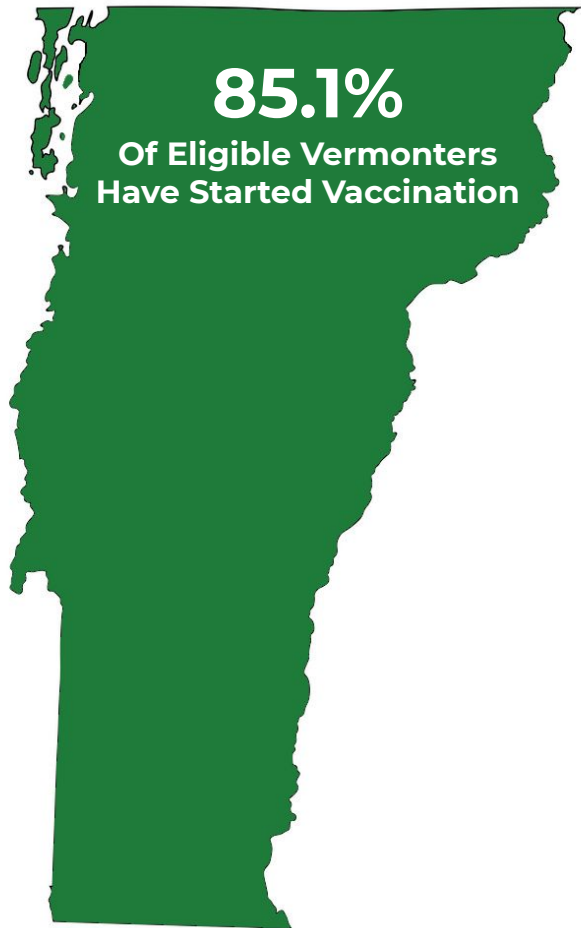


# VT Weekly COVID-19 Deaths Forecast

Calculated as a 7-day sum. Gray bands represent 50% and 95% confidence intervals. Since projections are only released once a week, the actual number may appear to over or undershoot the forecast.



# Vermont Vaccination Data



# Vermont Vaccination

**+2,825**

Since Last Week

**468,620**

Vermonters with  
at Least 1 Dose

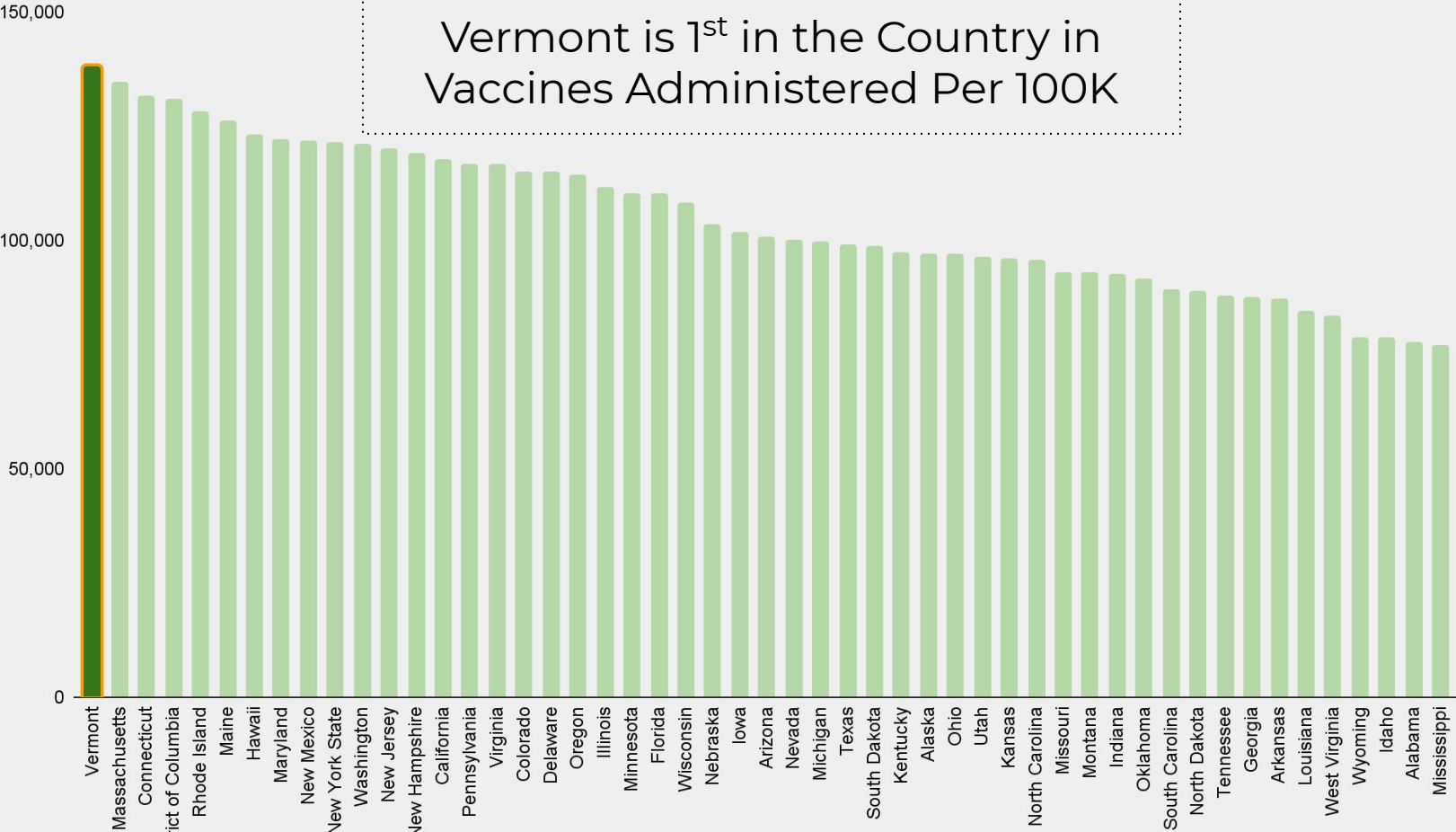
**82,330**

Eligible Vermonters  
still to be vaccinated

# Vermont CDC Vaccine Scorecard

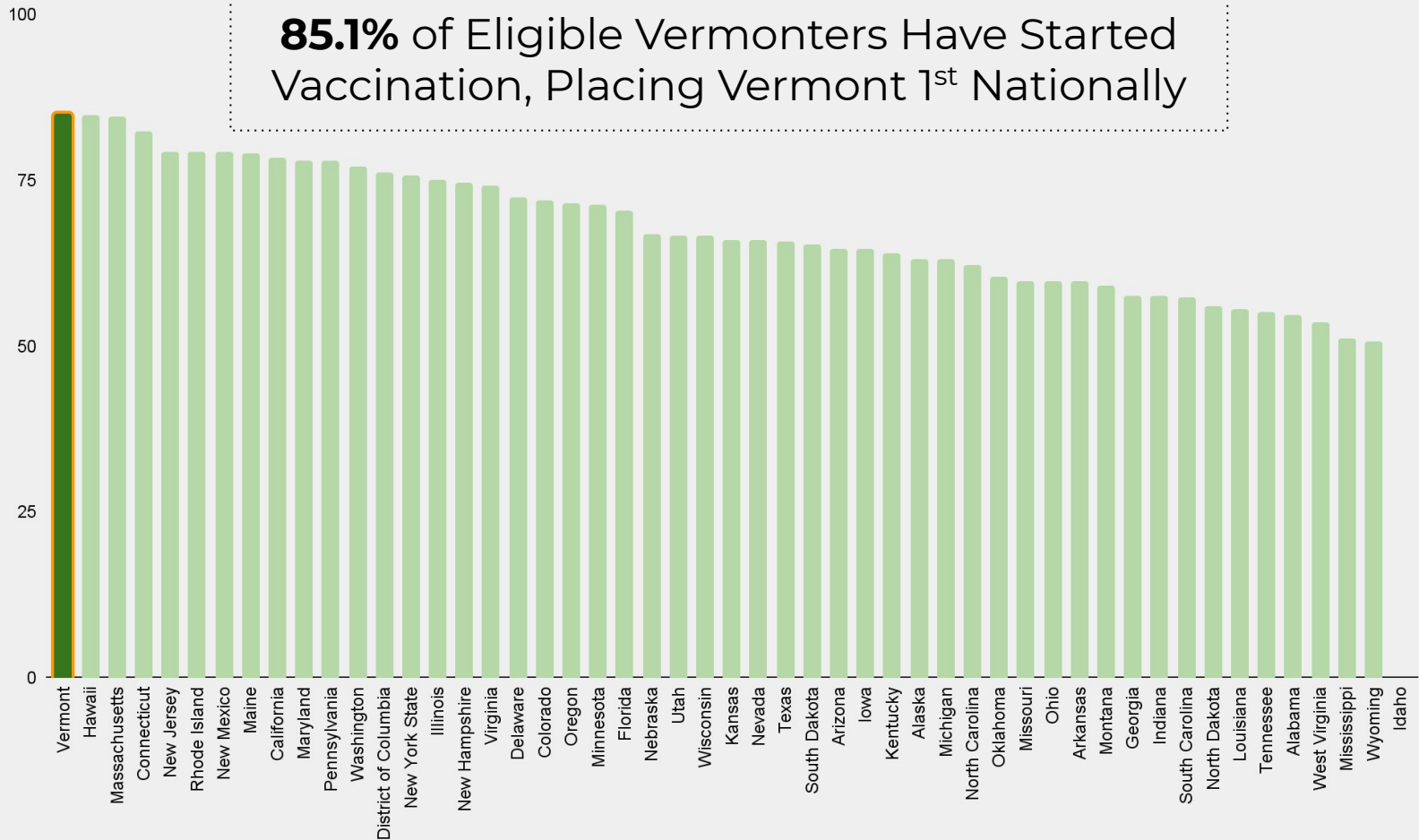
Metric	Figure	State Ranking
<b>Doses Administered per 100K</b>	<b>137,995</b>	<b>1</b>
<b>% At Least 1 Dose (Eligible Population)</b>	<b>85.1%</b>	<b>1</b>
<b>% Fully Vaccinated (Eligible Population)</b>	<b>75.4%</b>	<b>1</b>
<b>% At Least 1 Dose (Full Population)</b>	<b>75.1%</b>	<b>1</b>
<b>% Fully Vaccinated (Full Population)</b>	<b>67.1%</b>	<b>1</b>
<b>% Fully Vaccinated (65 &amp; Over)</b>	<b>93.6%</b>	<b>1</b>

Vermont is 1<sup>st</sup> in the Country in  
Vaccines Administered Per 100K



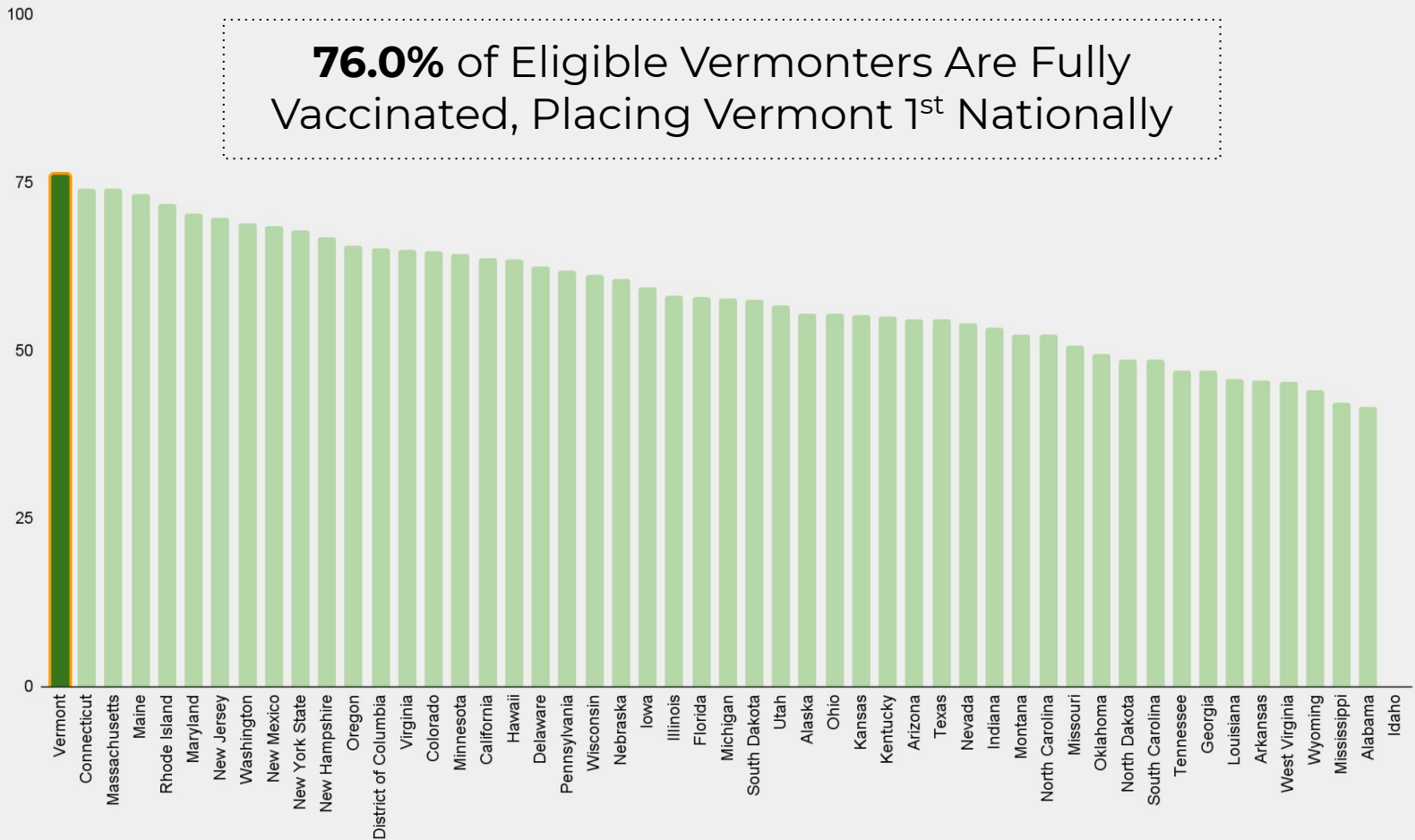
Source: CDC—August 16, 2021

**85.1%** of Eligible Vermonters Have Started Vaccination, Placing Vermont 1<sup>st</sup> Nationally



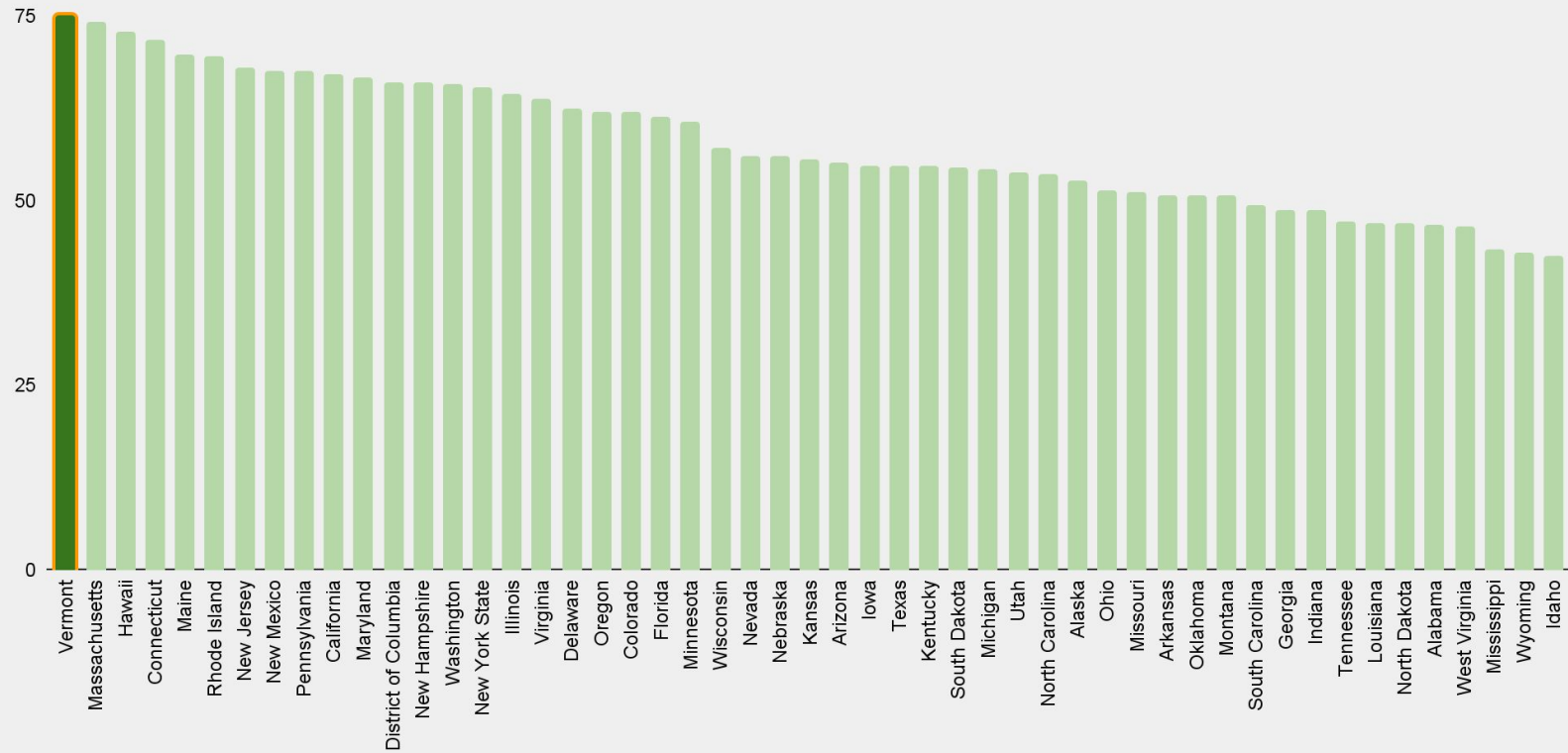
Source: CDC—August 16, 2021

**76.0%** of Eligible Vermonters Are Fully Vaccinated, Placing Vermont 1<sup>st</sup> Nationally



Source: CDC—August 16, 2021

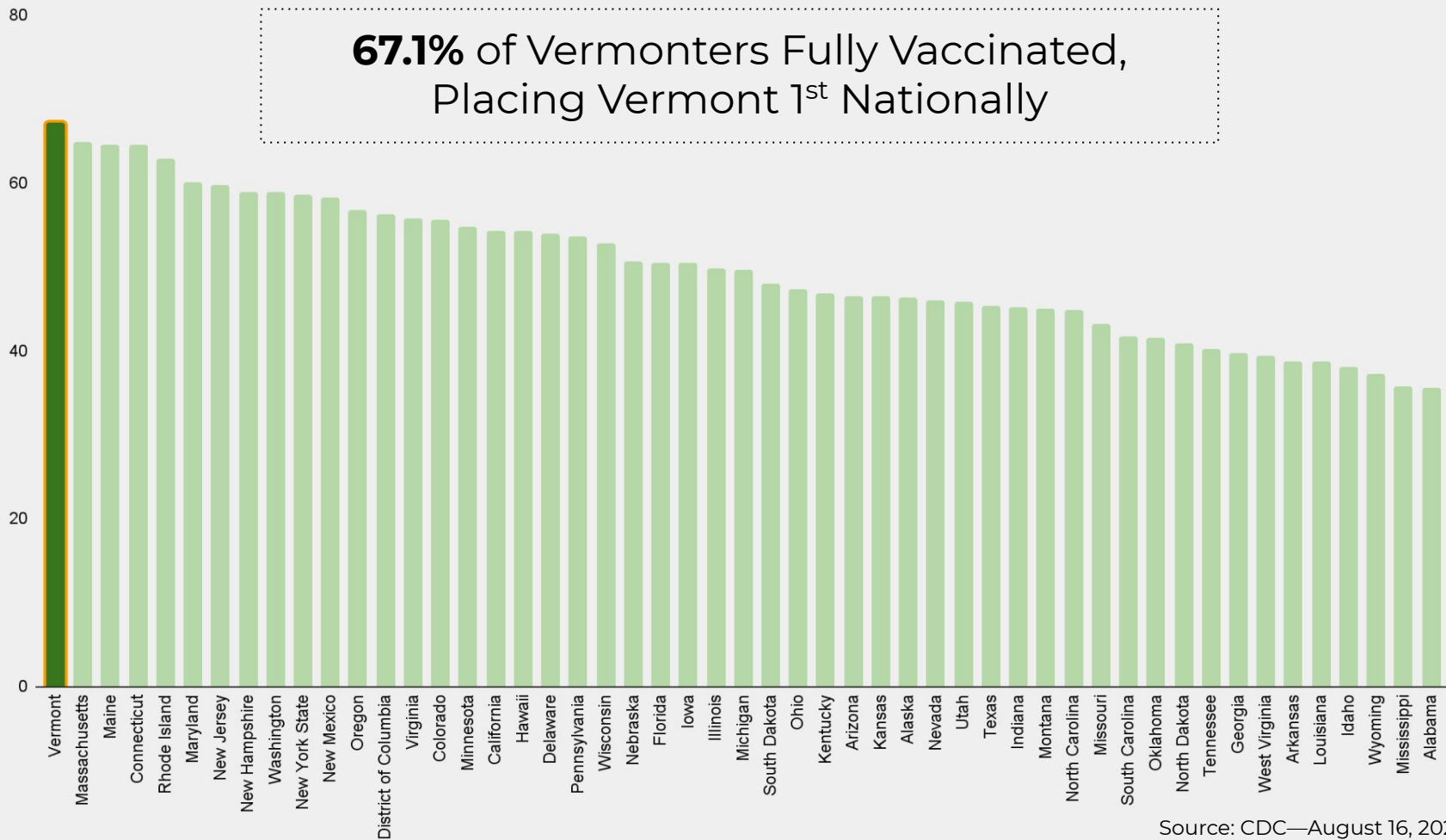
# 75.1% of Vermonters Have Started Vaccination, Placing Vermont 1<sup>st</sup> Nationally



Source: CDC—August 16, 2021

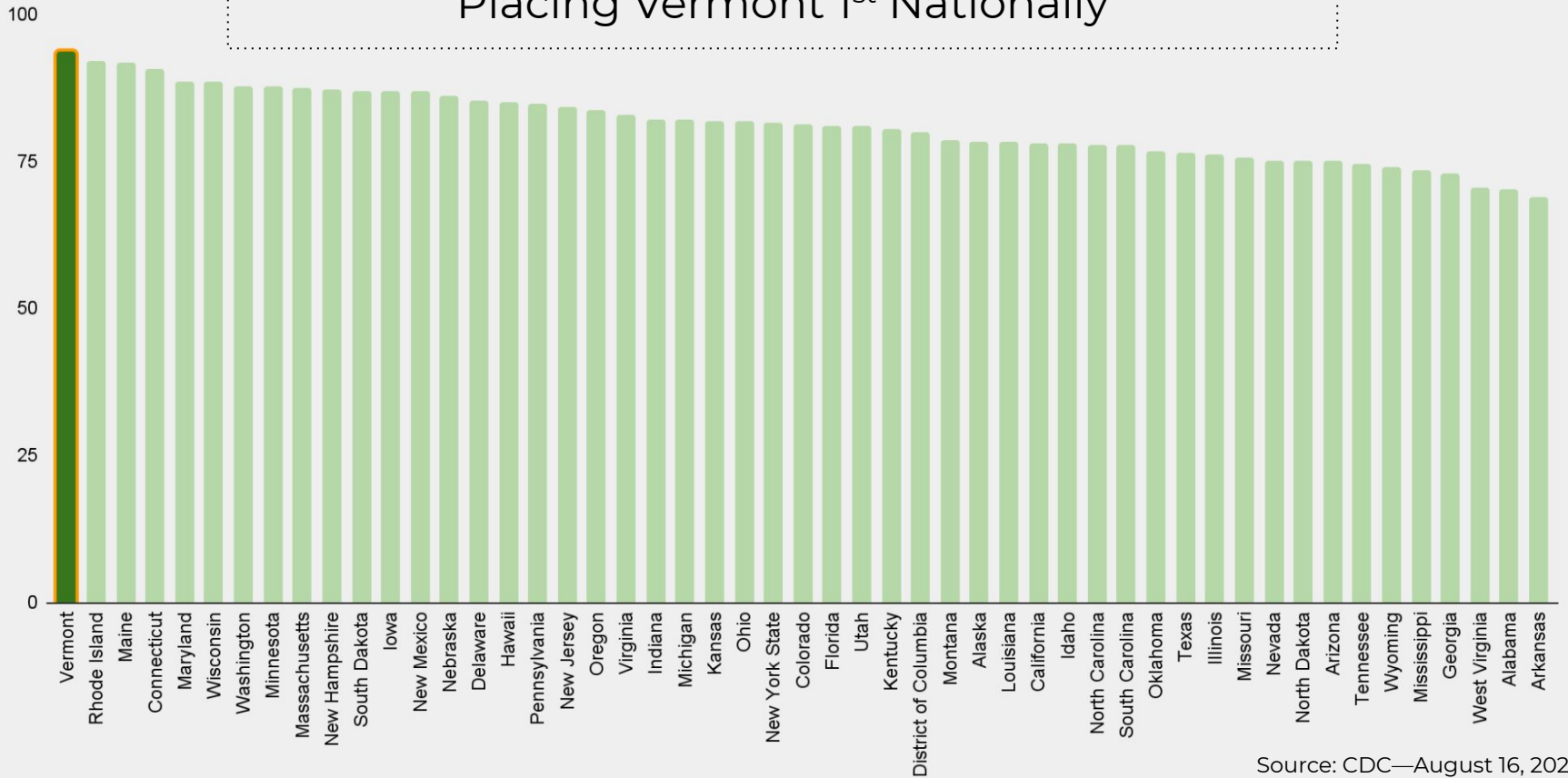


**67.1%** of Vermonters Fully Vaccinated,  
Placing Vermont 1<sup>st</sup> Nationally



Source: CDC—August 16, 2021

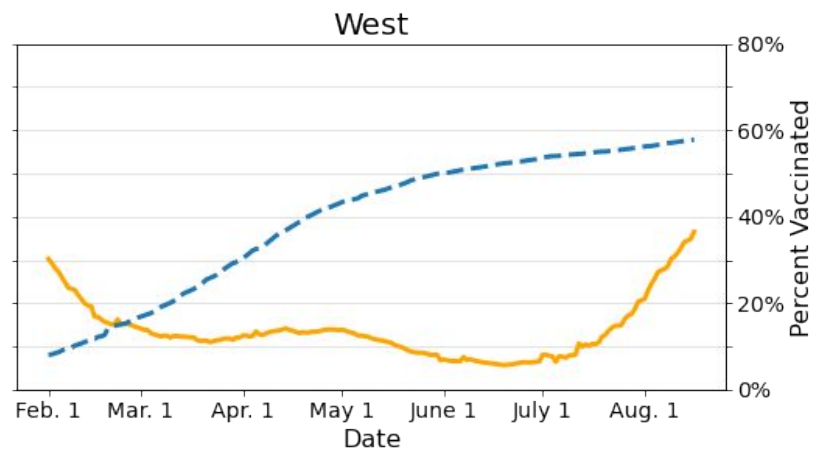
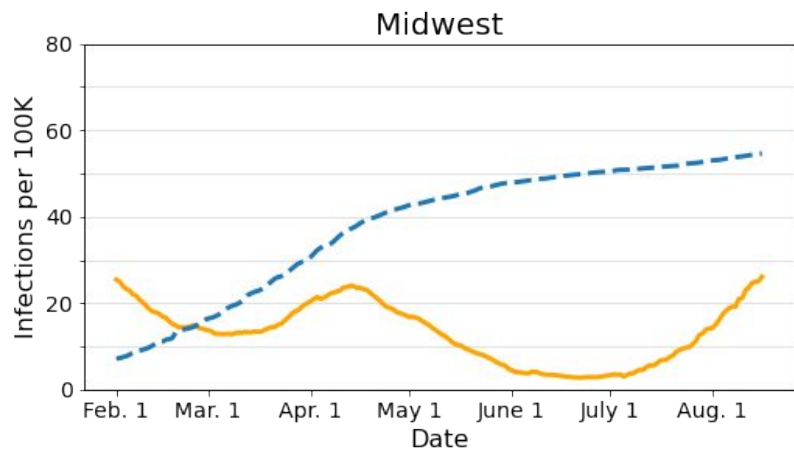
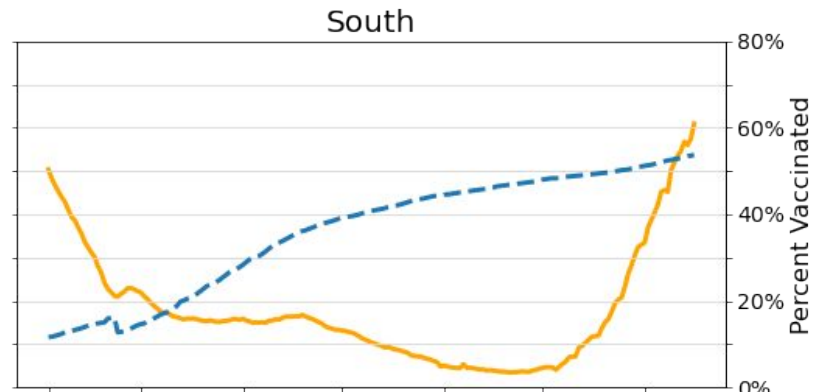
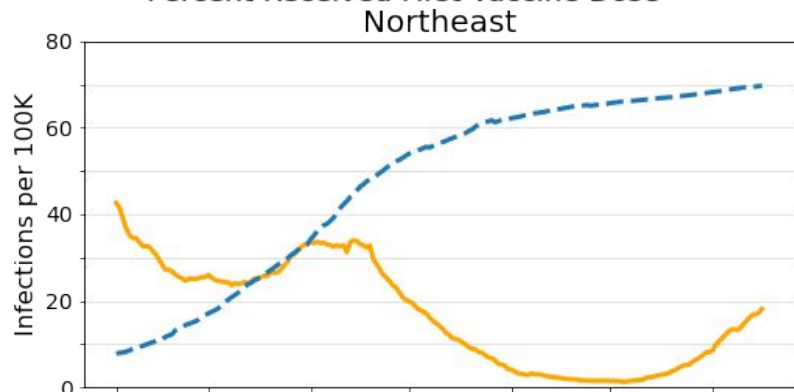
**93.6%** of 65 & Over Vermonters Fully Vaccinated,  
Placing Vermont 1<sup>st</sup> Nationally



Source: CDC—August 16, 2021

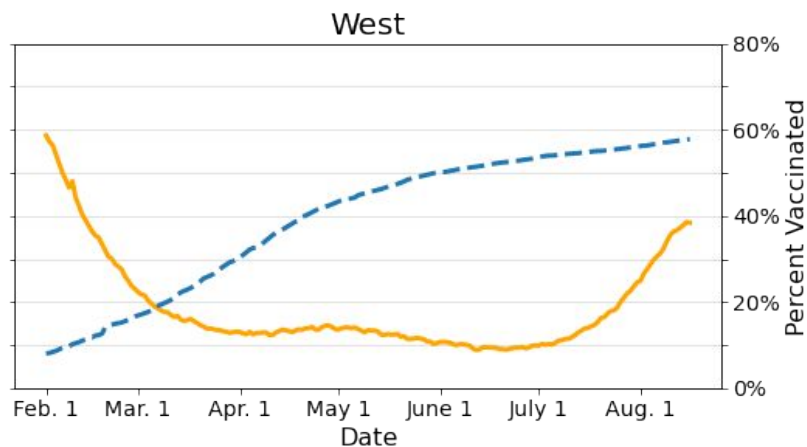
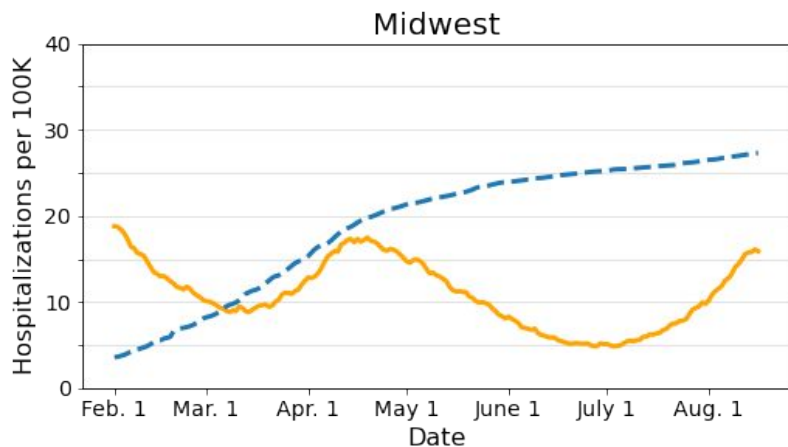
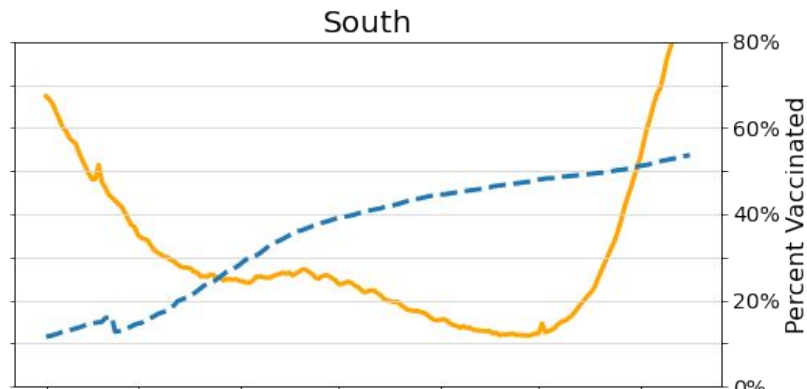
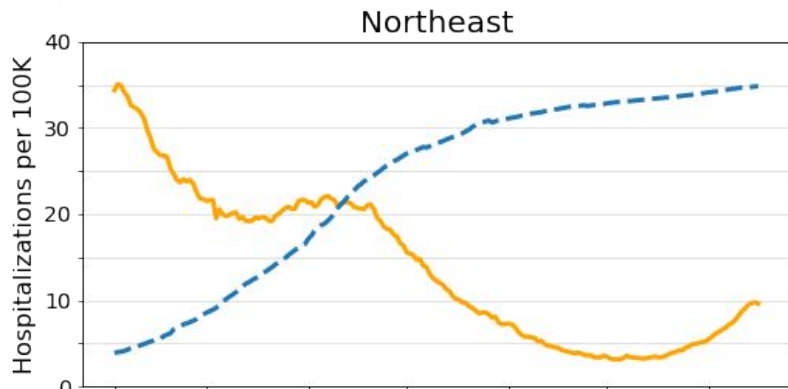
# US Census Region Case Rate & Vaccination

- New Infections per 100K (14-Day Average)
- - Percent Received First Vaccine Dose



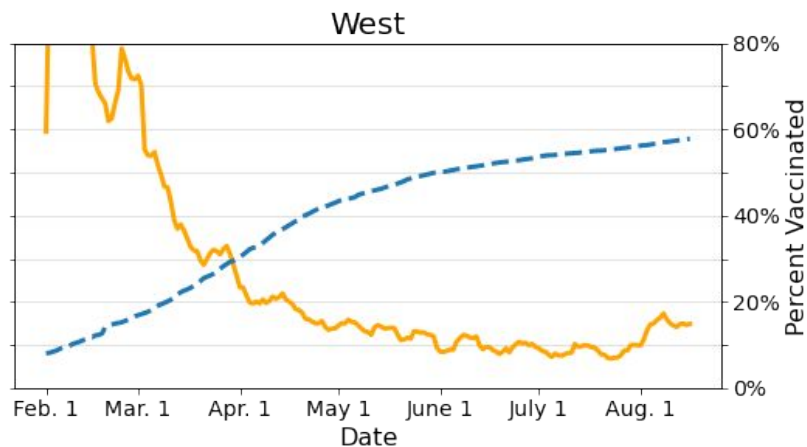
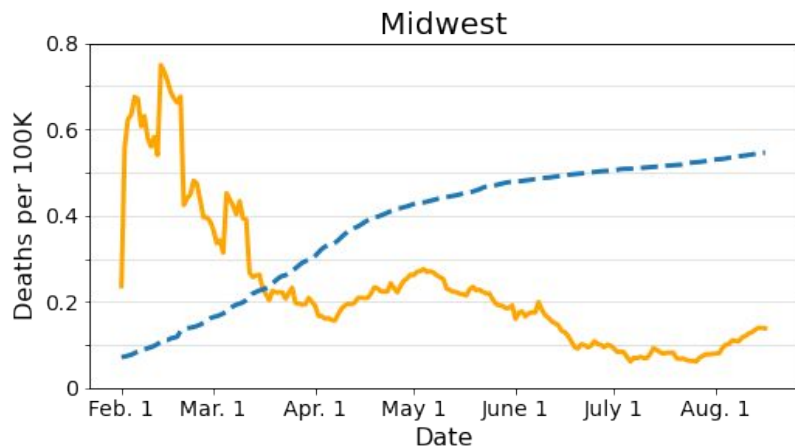
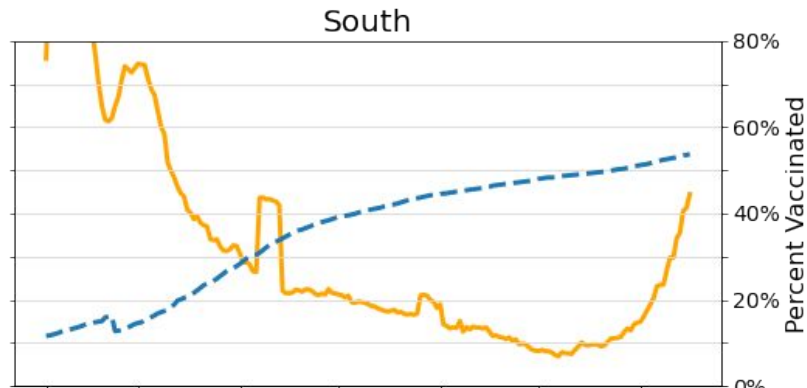
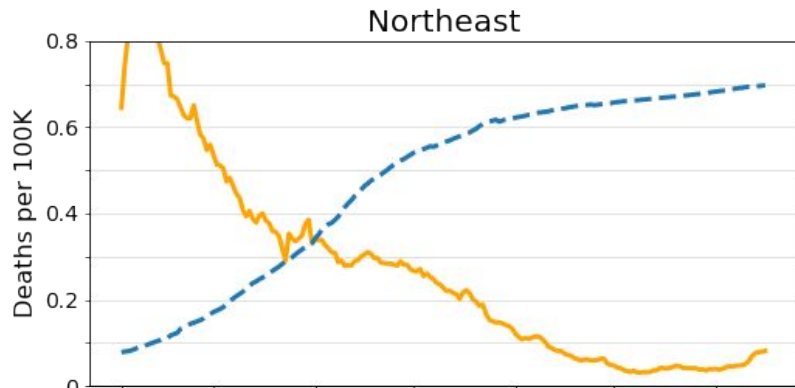
# US Census Region Hospitalizations & Vaccination

— Hospitalizations per 100K (14-Day Average)  
- - Percent Received First Vaccine Dose



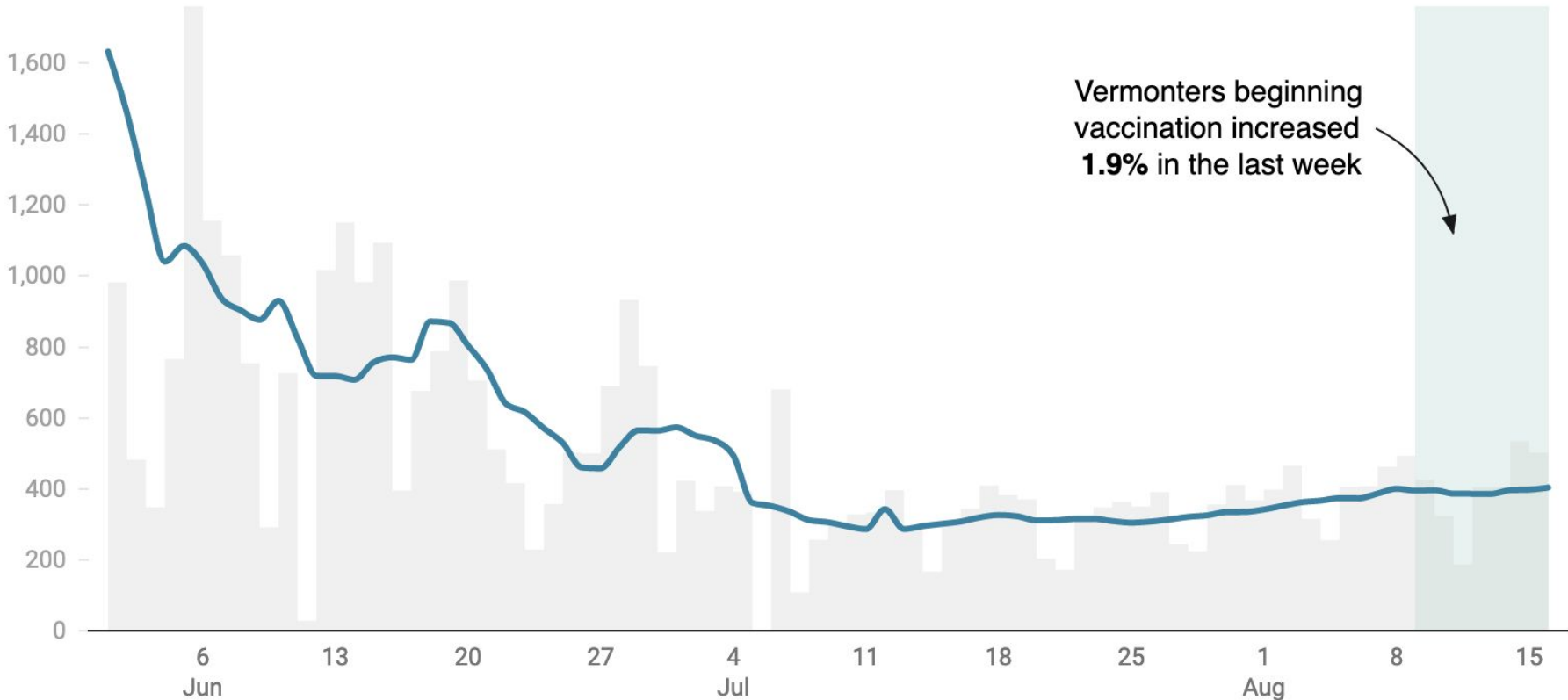
# US Census Region Deaths & Vaccination

— Deaths per 100K (14-Day Average)  
- - Percent Received First Vaccine Dose



# Vermonters Initiating Vaccination by Day

— New Vaccinations (7-Day Average)



Vermonters beginning vaccination increased **1.9%** in the last week

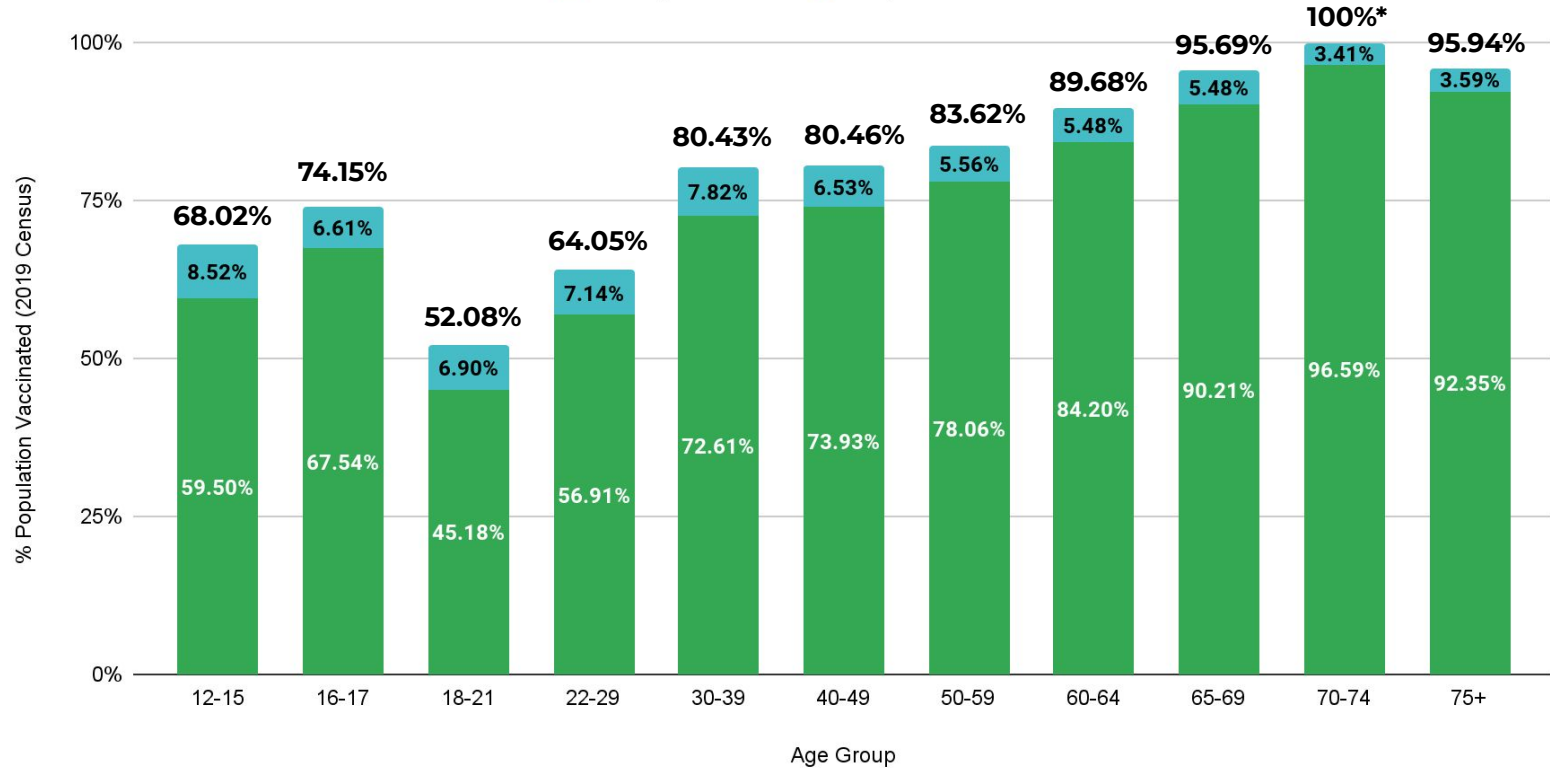


Source: CDC—August 16, 2021

# Vermont Vaccination Progress

By Age Band

Partially Vaccinated Fully Vaccinated



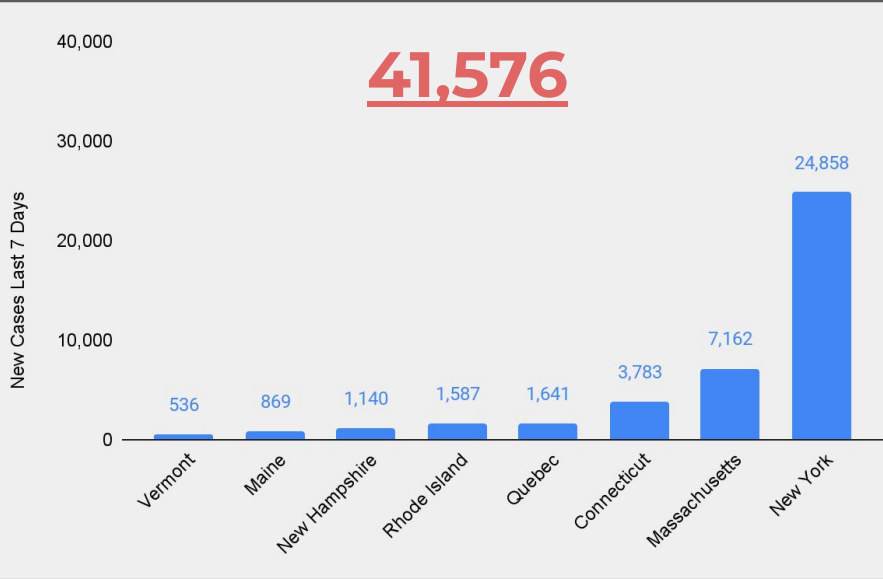
# Regional Data



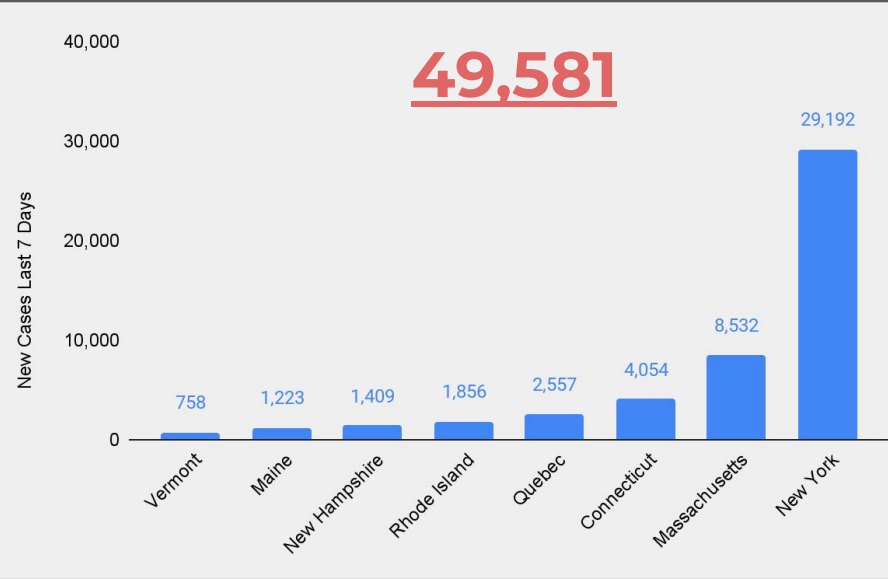
# Regional Cases

## 19.3% Increase in New Cases

New Cases August 3rd to August 9th



New Cases August 10th to August 16th



# Weekly Regional Cases

250000

200000

150000

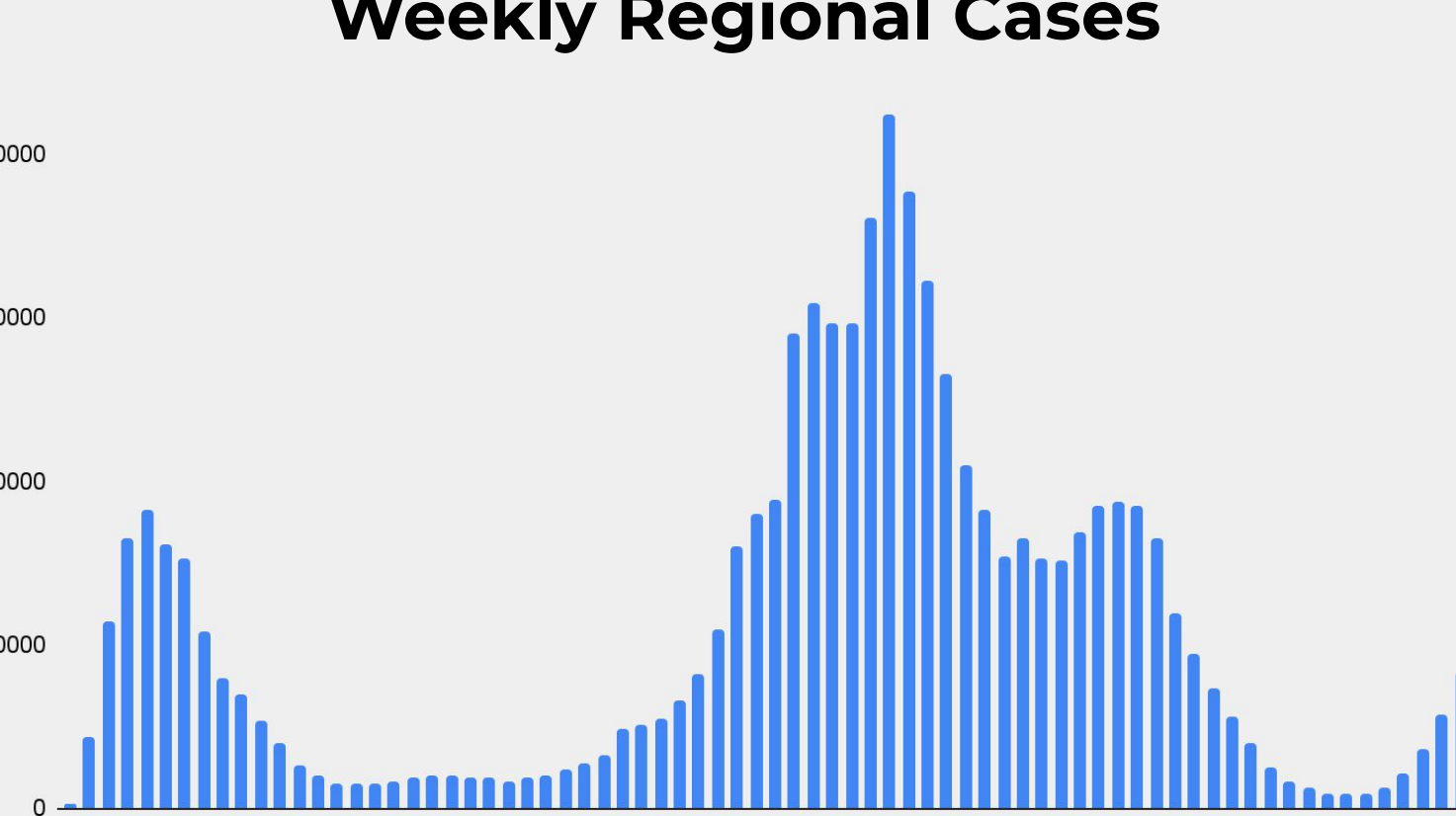
100000

50000

0

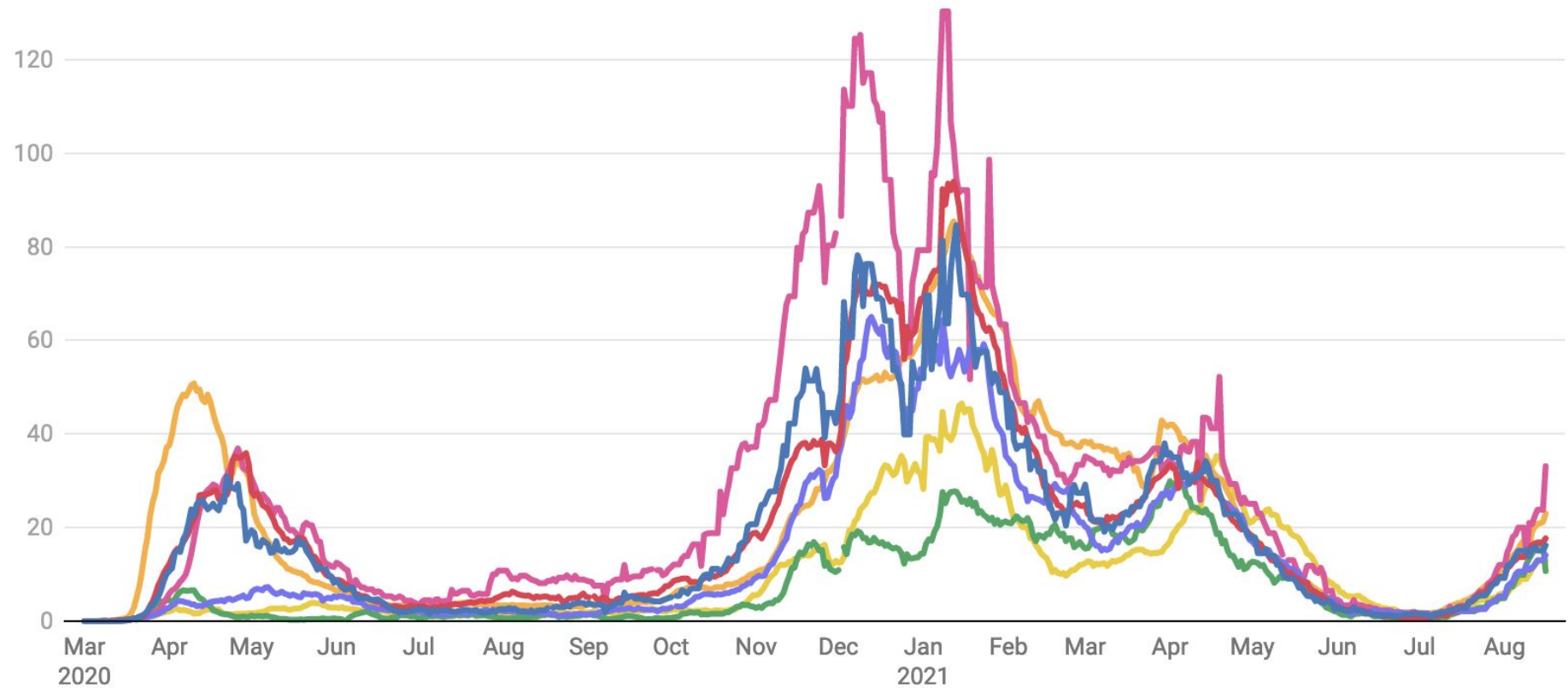
3/16/20 4/6/20 4/27/20 5/18/20 6/8/20 6/29/20 7/20/20 8/10/20 8/31/20 9/21/20 10/12/20 11/2/20 11/23/20 12/14/20 1/4/21 1/25/21 2/15/21 3/8/21 3/29/21 4/19/21 5/10/21 5/31/21 6/21/21 7/12/21 8/2/21

Sources: State Health Departments & CTV National News (Quebec) (includes: CT, ME, MA, NH, NY, QC, RI & VT)

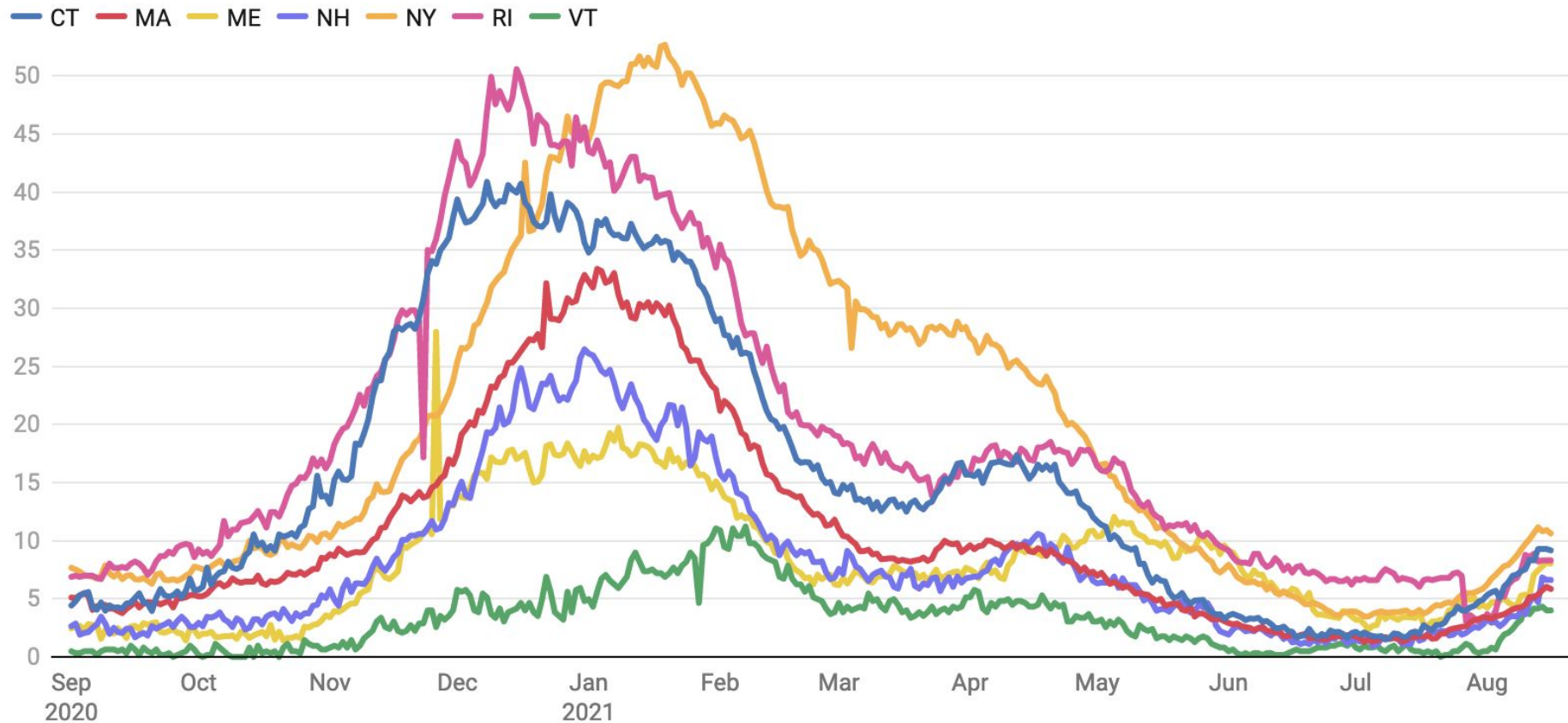


# COVID Cases per 100K (7-Day Average)

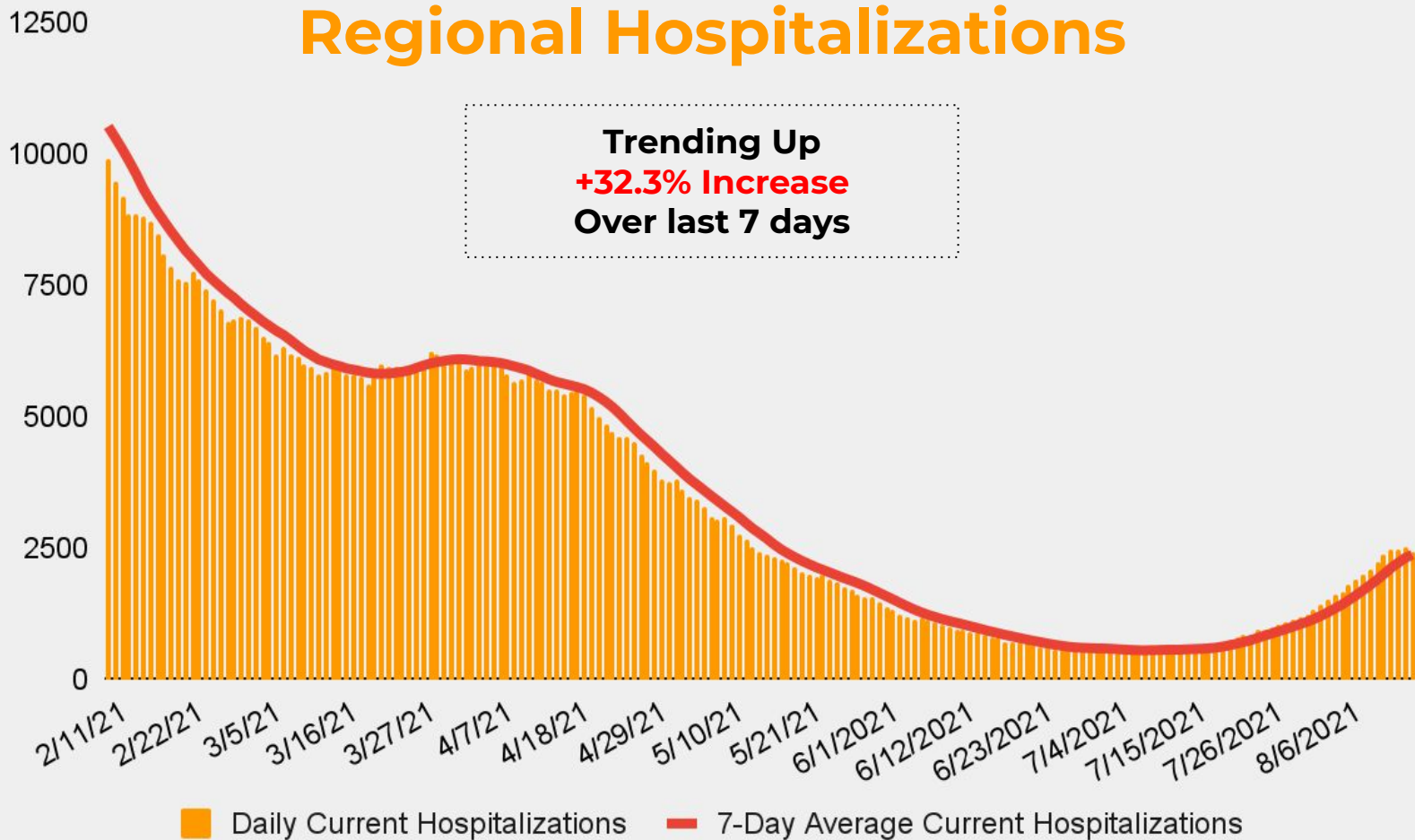
CT MA ME NH NY RI VT



# COVID Hospitalizations per 100K

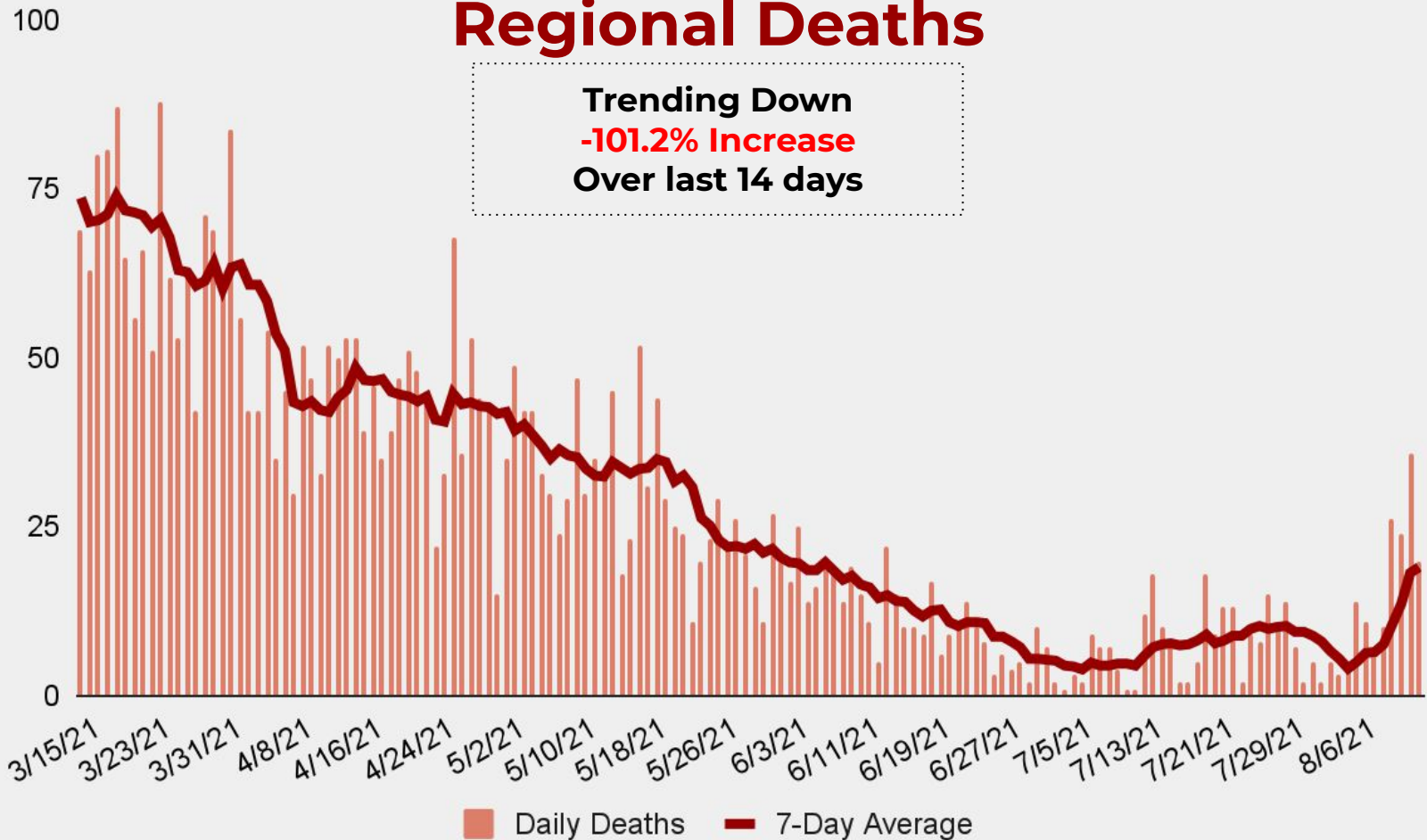


# Regional Hospitalizations



Source: Covid Act Now (7-Day Average in CT, ME, MA, NH, NY, RI & VT)—August 16, 2021

# Regional Deaths

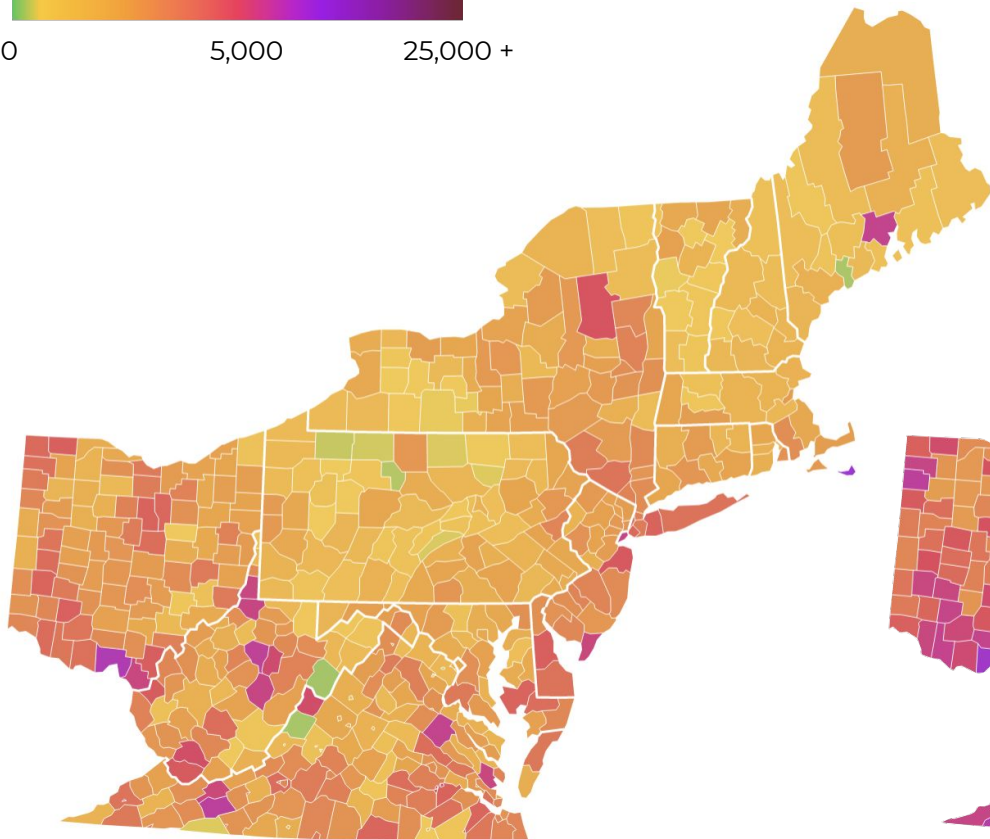


Source: CDC (7-Day Average in CT, ME, MA, NH, NY, RI & VT)—August 13, 2021

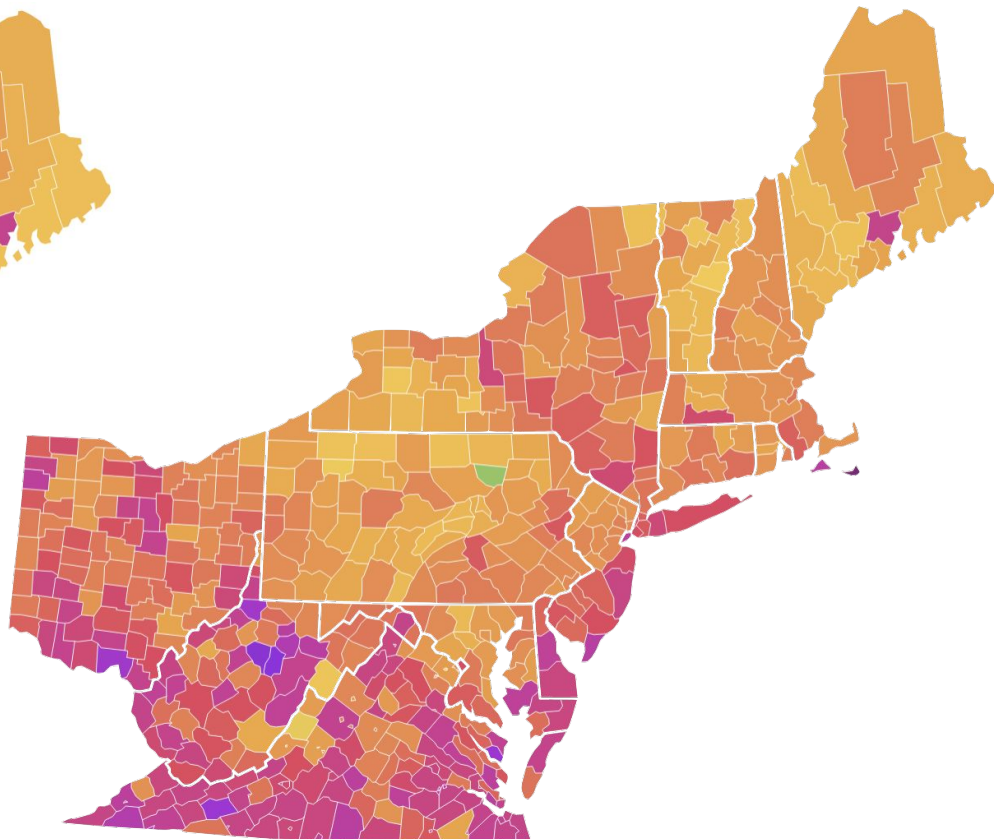
# Active Cases per Million



0                      5,000                      25,000 +



Last Week  
August 10th

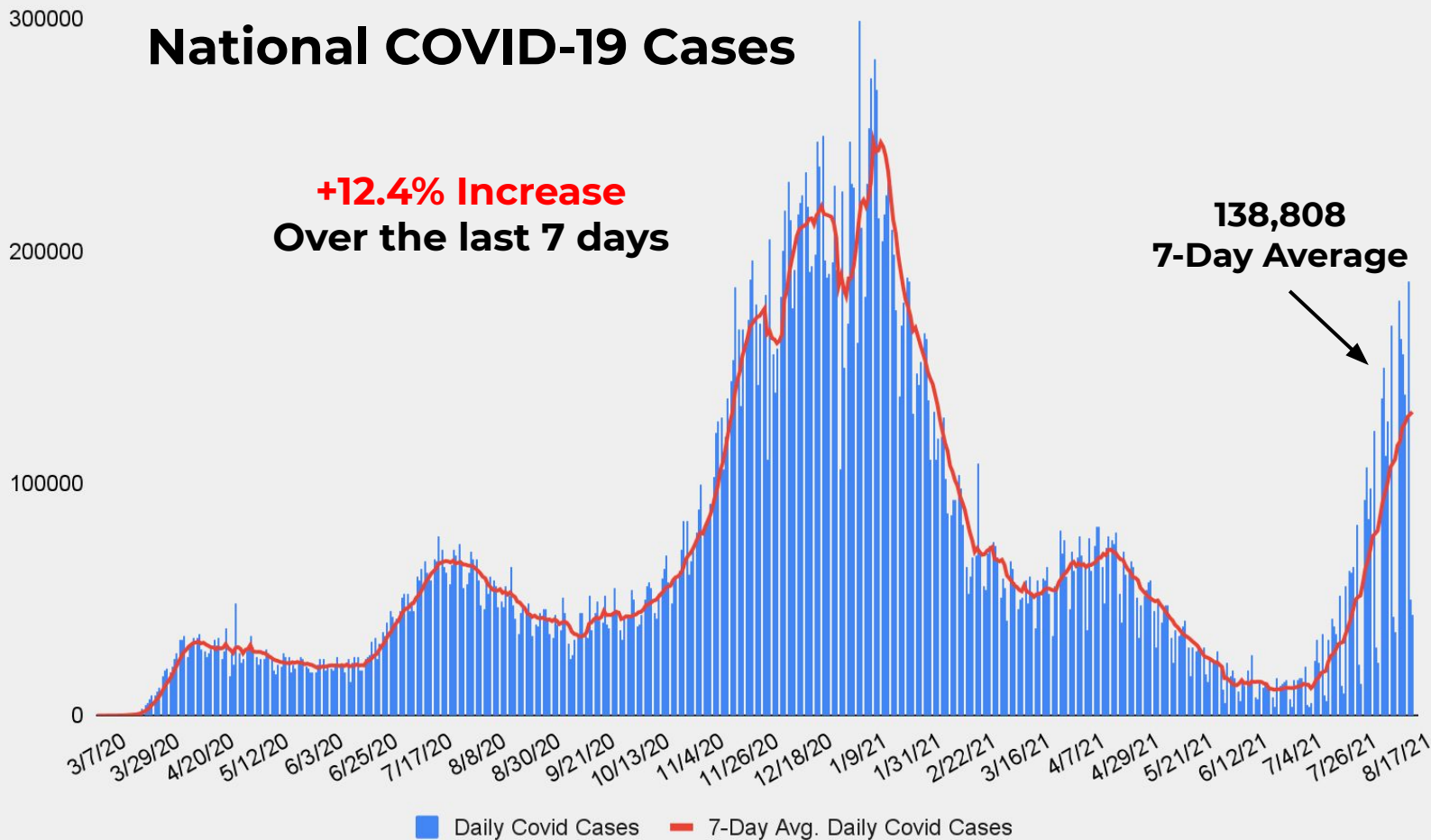


Today  
August 17th

# National Data

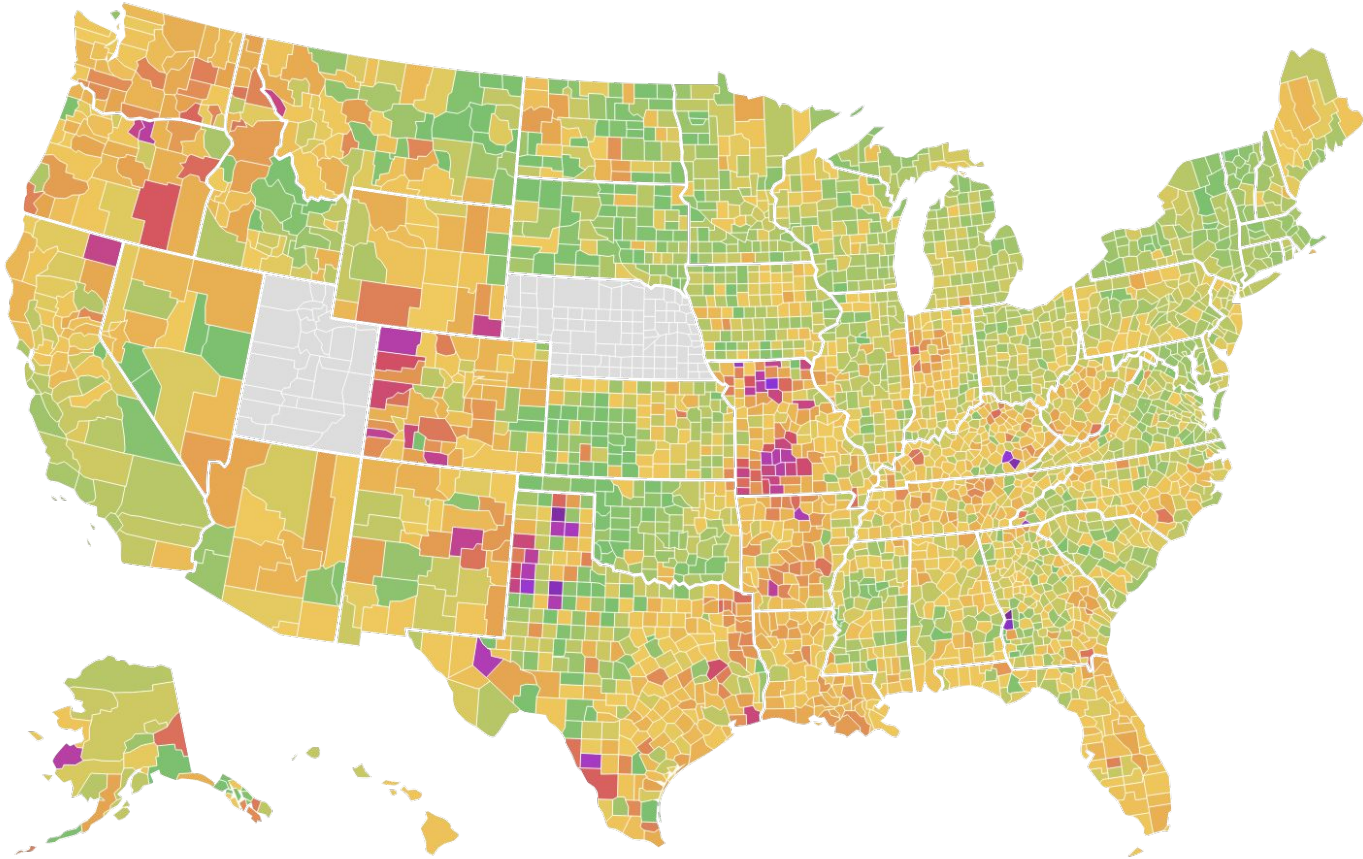
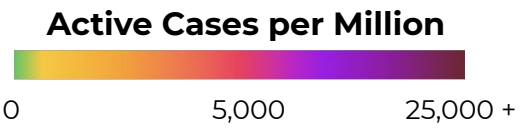


# National COVID-19 Cases



Source: Covid Tracking Project; NYT & CDC—August 16, 2021

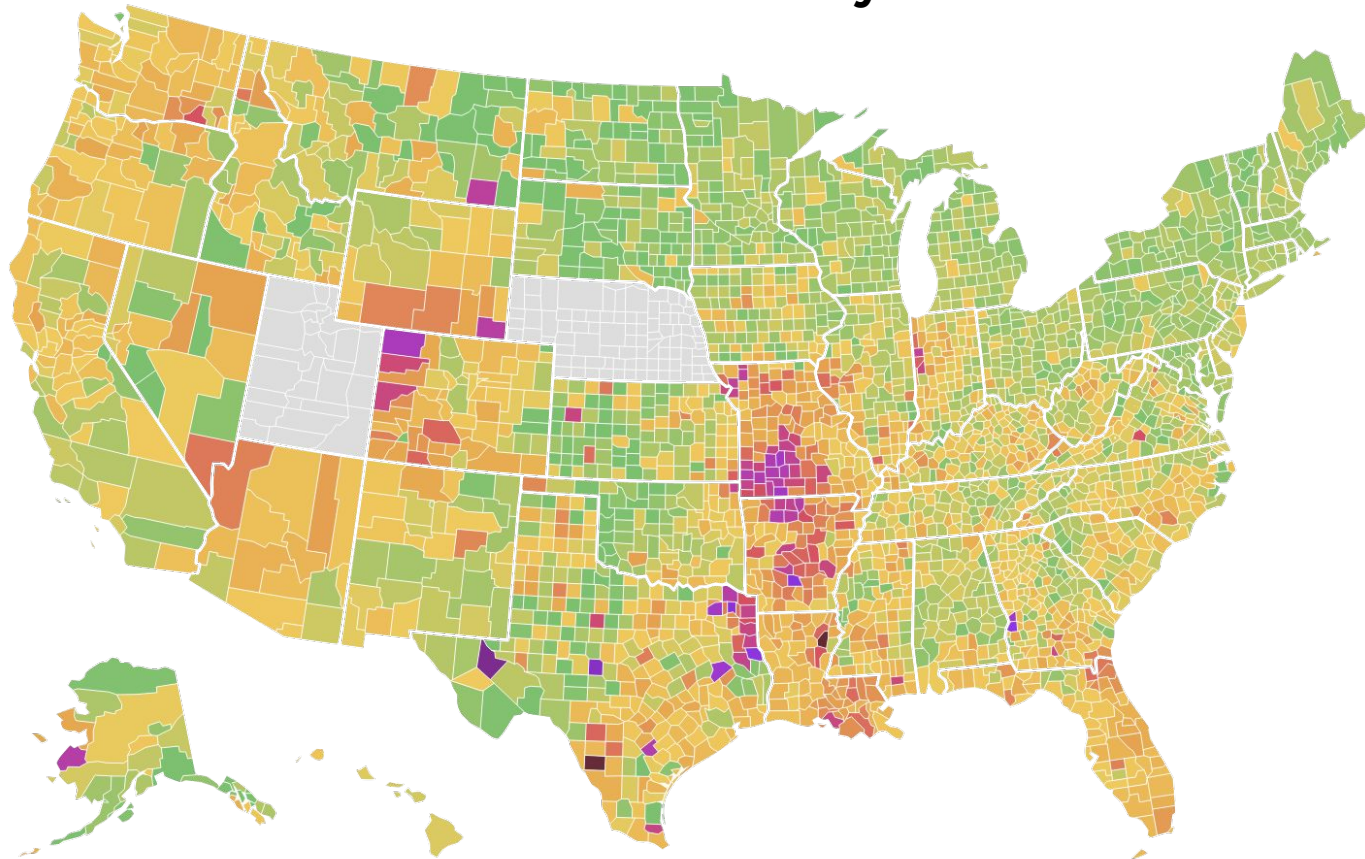
# Beginning of Delta Spread June 22



# Active Cases per Million



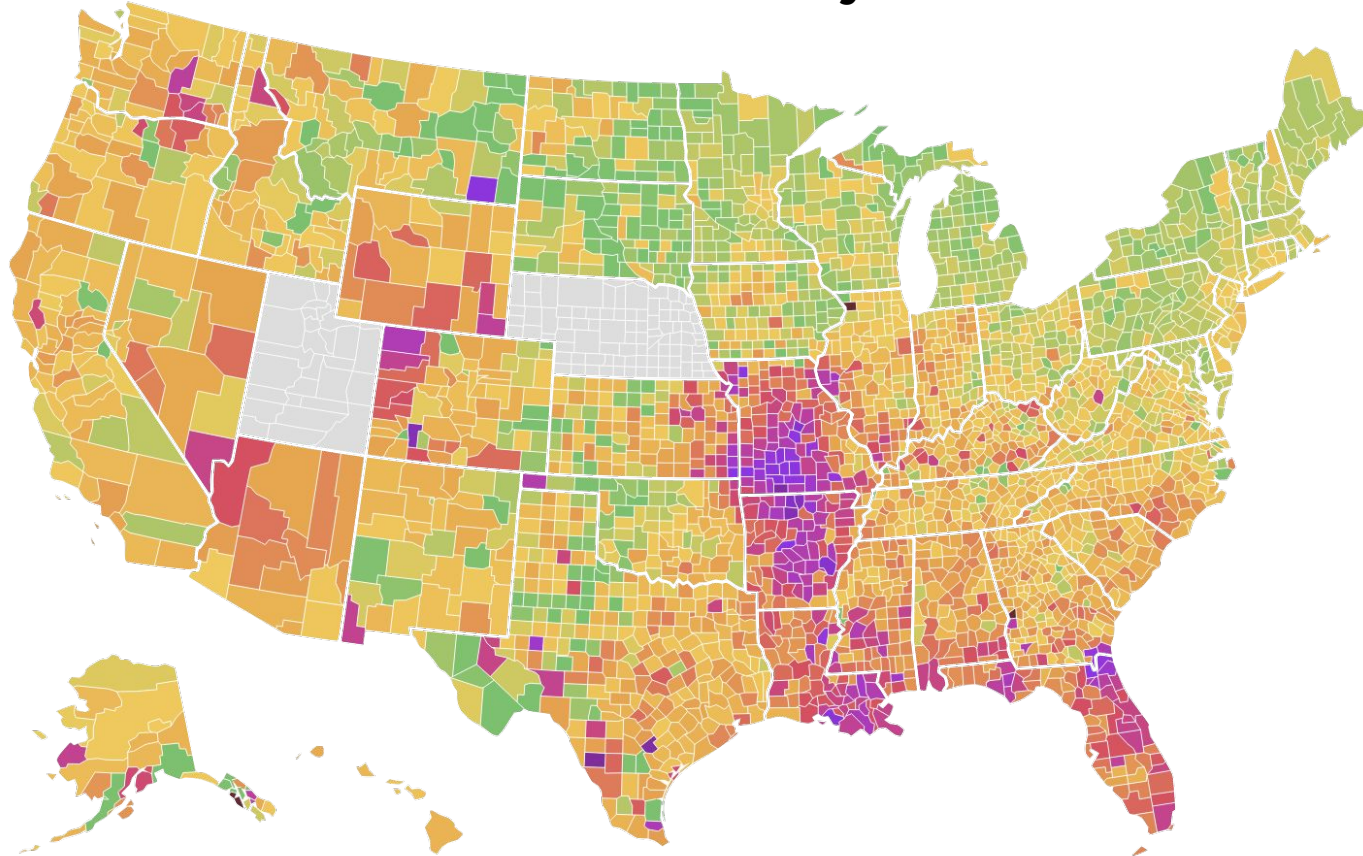
# Delta Spread July 6



## Active Cases per Million



# Delta Spread July 20

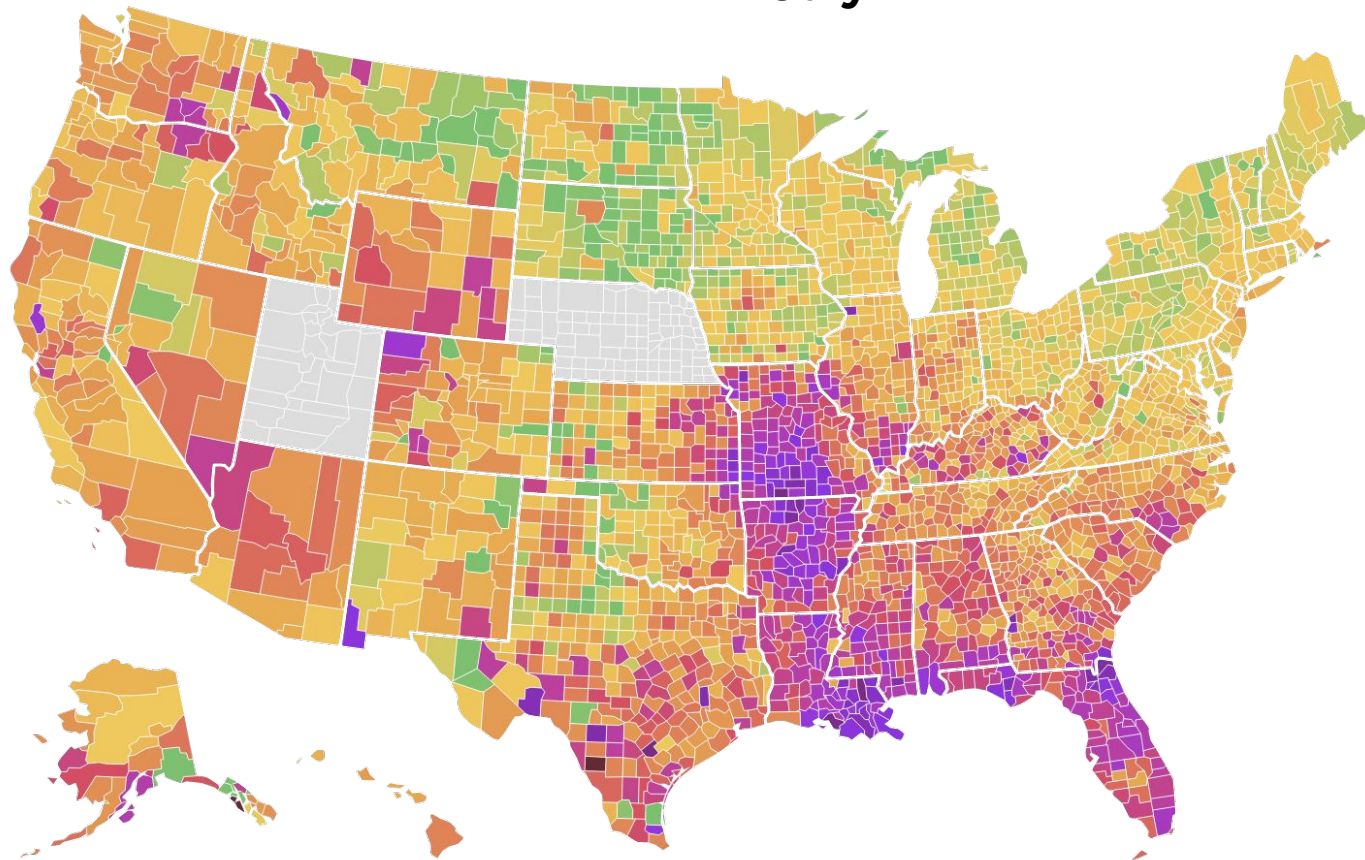


## Active Cases per Million



# Delta Spread

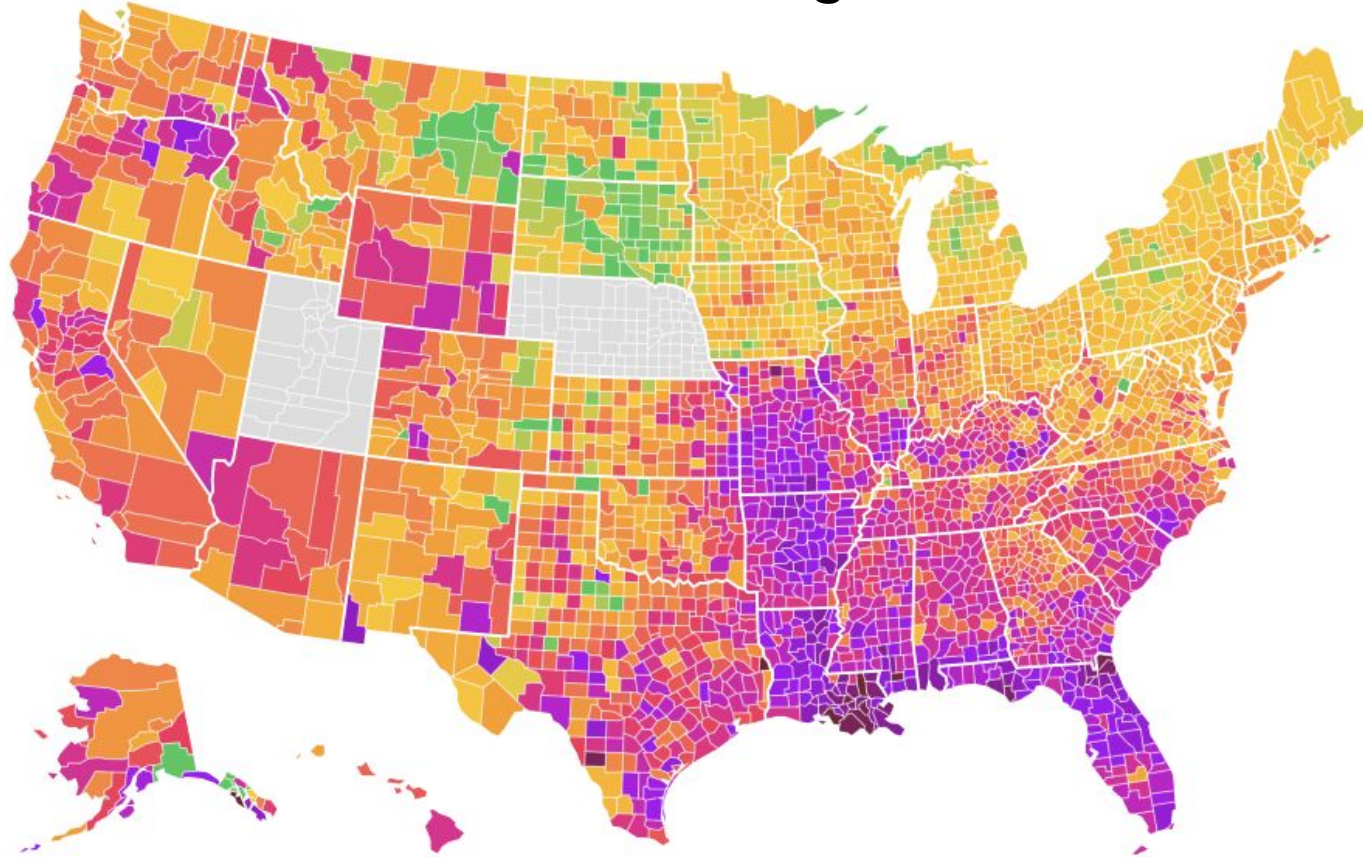
## July 27



## Active Cases per Million



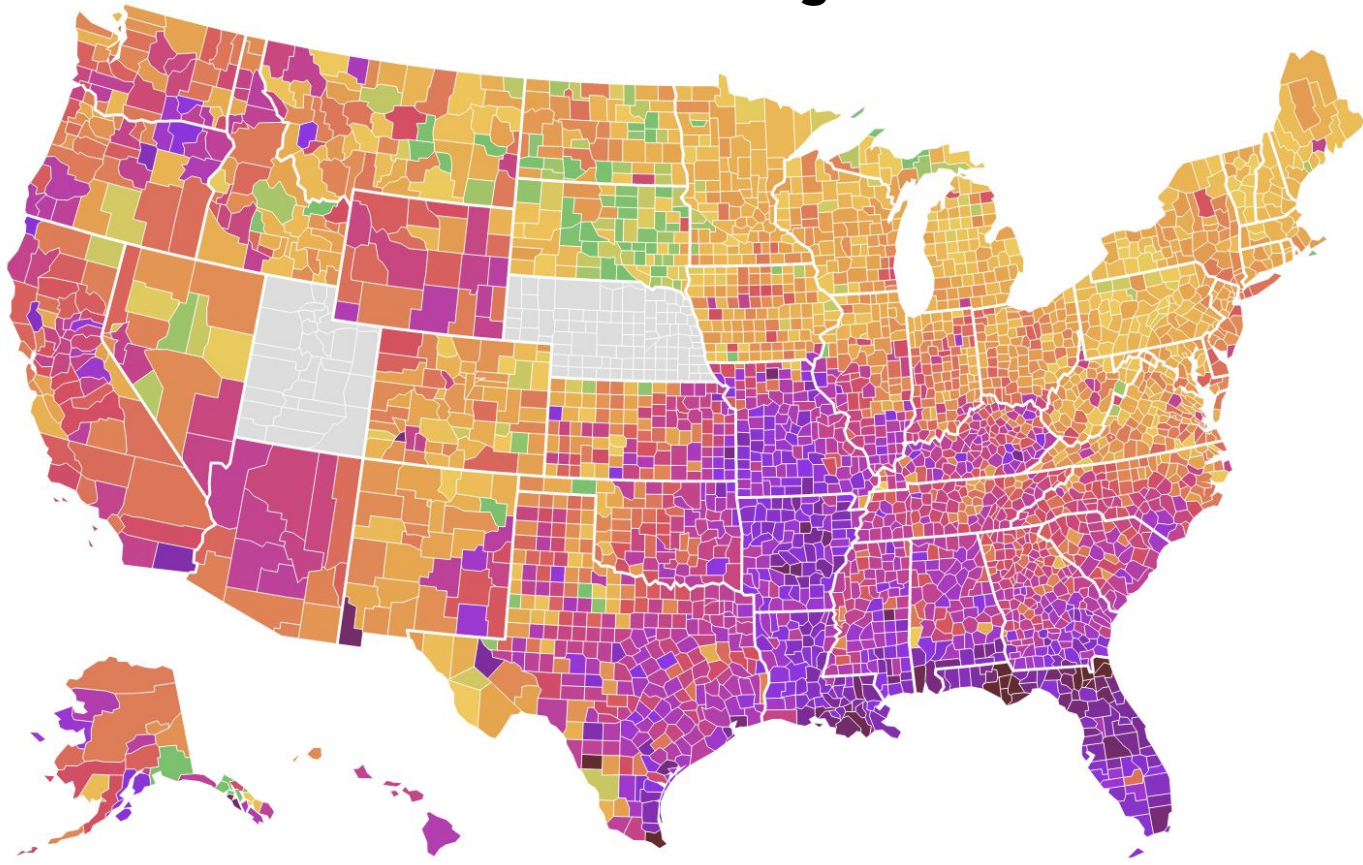
# Delta Spread August 3



## Active Cases per Million



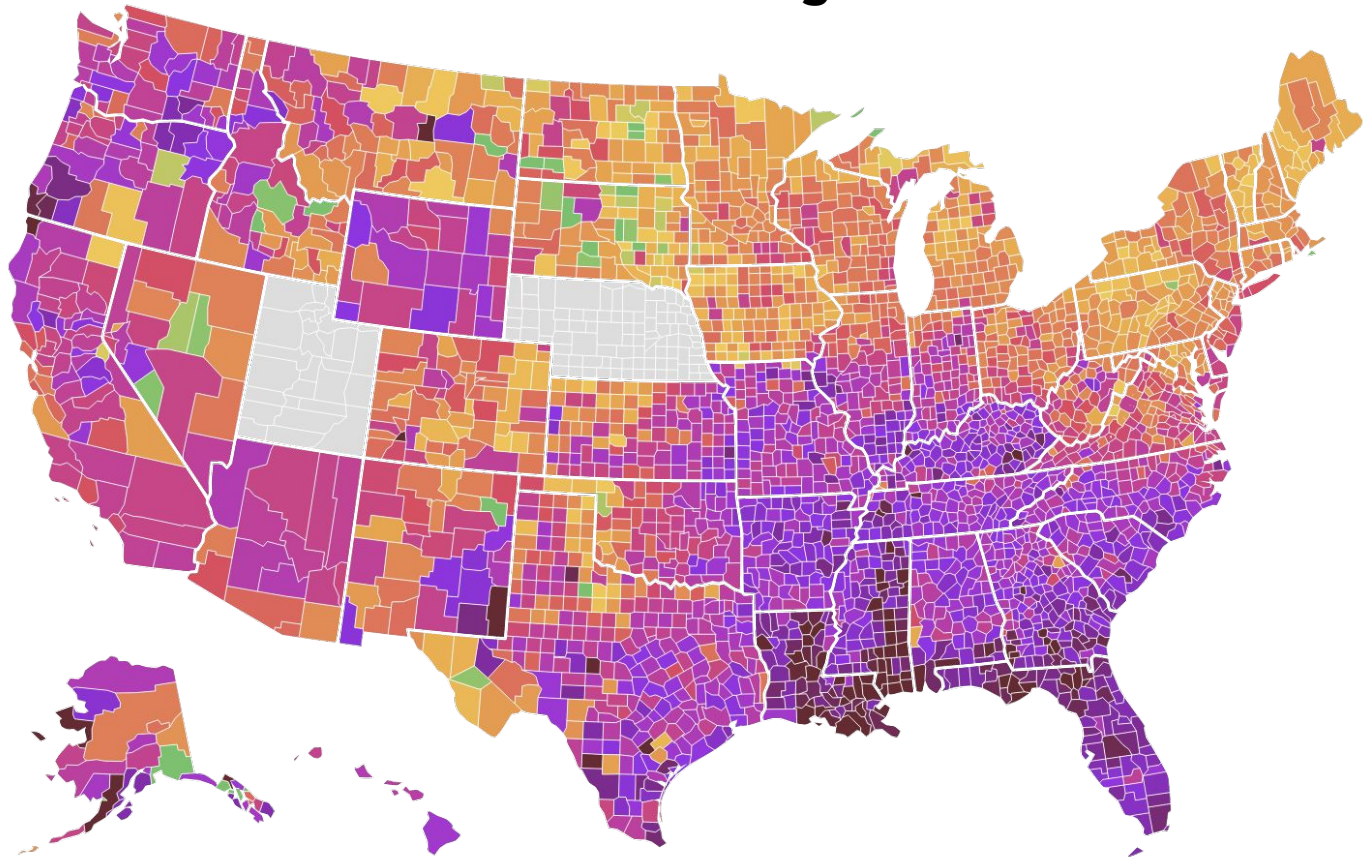
## Delta Spread August 10



## Active Cases per Million



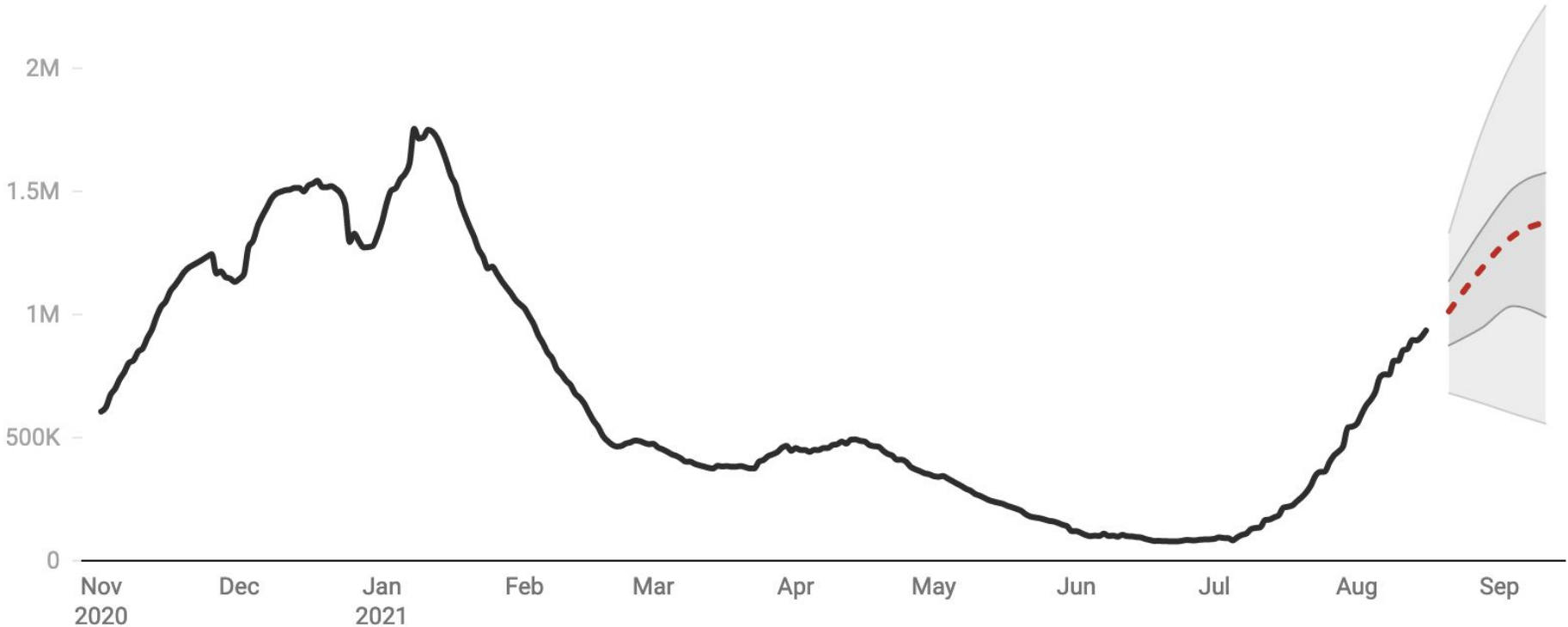
# Delta Spread August 16





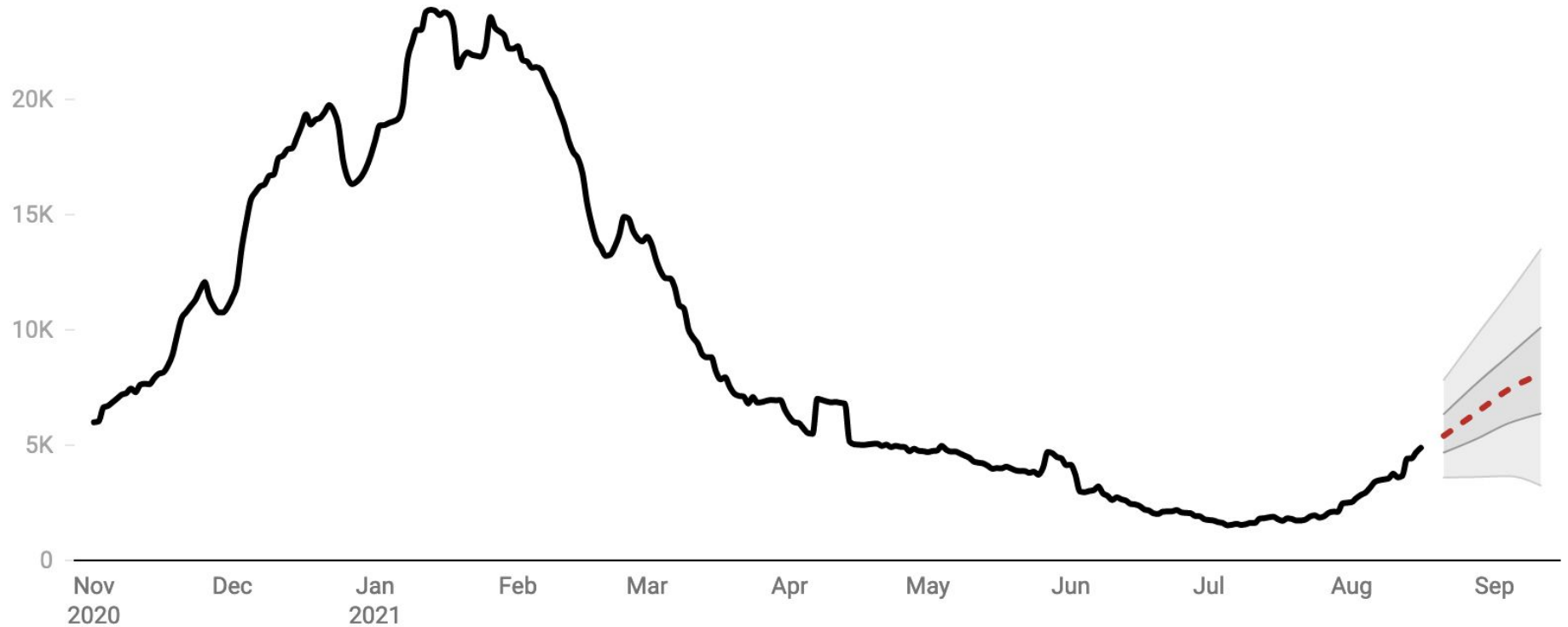
# US Weekly COVID-19 Infections Forecast

Calculated as a 7-day sum. Gray bands represent 50% and 95% confidence intervals. Since projections are only released once a week, the actual number may appear to over or undershoot the forecast.



# US Weekly COVID-19 Deaths Forecast

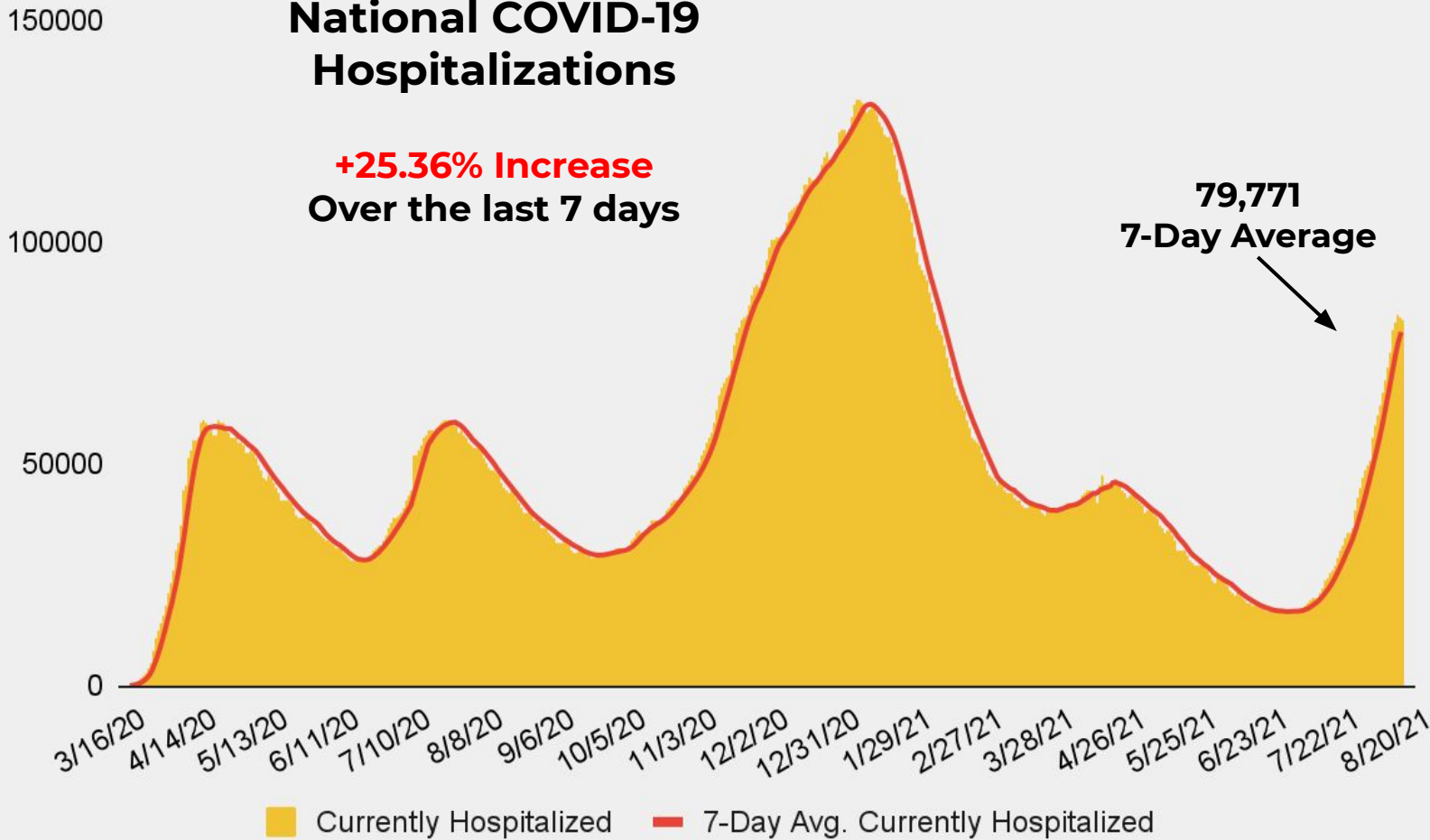
Calculated as a 7-day sum. Gray bands represent 50% and 95% confidence intervals. Since projections are only released once a week, the actual number may appear to over or undershoot the forecast.



# National COVID-19 Hospitalizations

**+25.36% Increase  
Over the last 7 days**

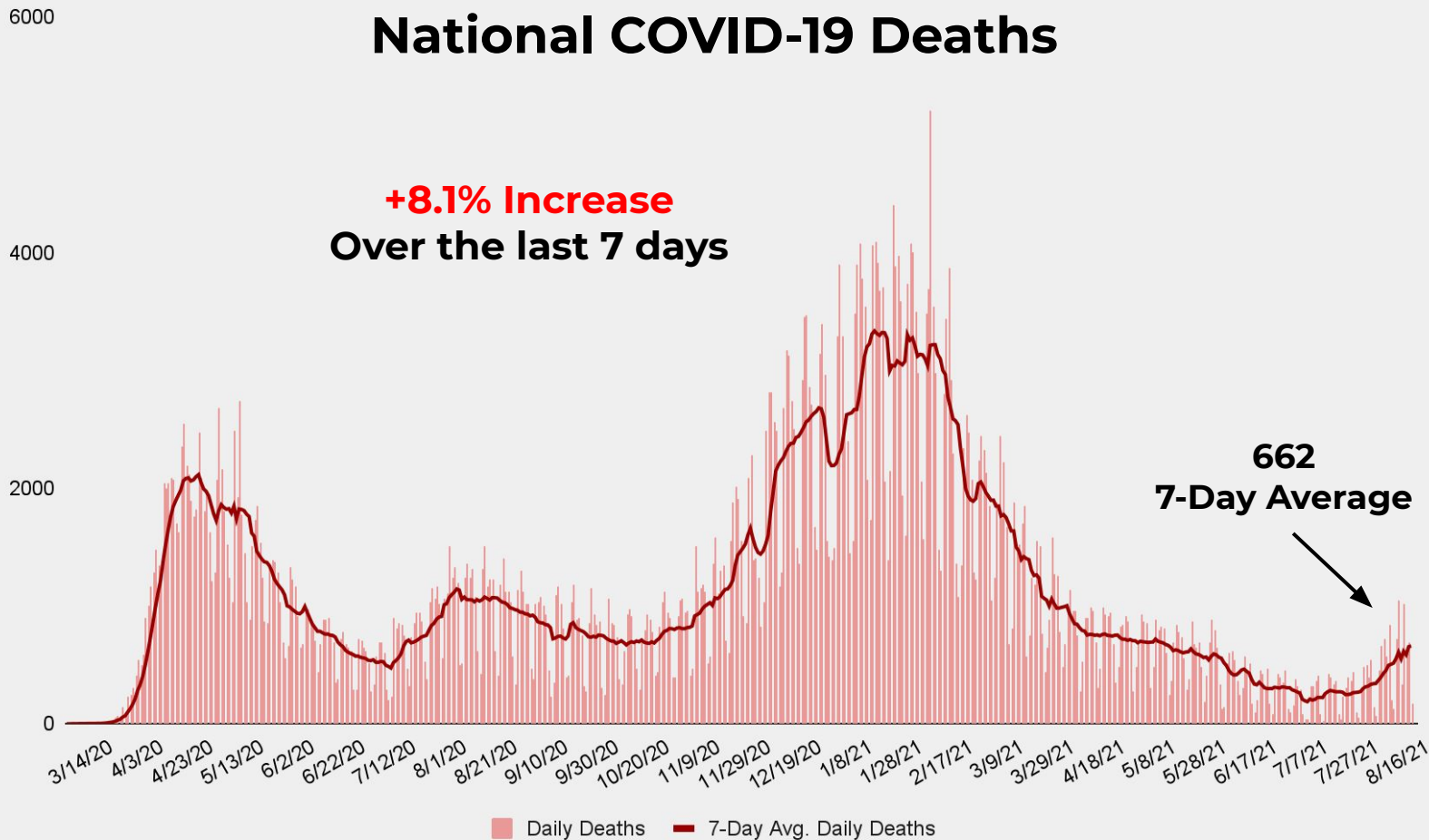
**79,771  
7-Day Average**



Source: Covid Tracking Project; NYT & CDC—August 16, 2021

# National COVID-19 Deaths

**+8.1% Increase  
Over the last 7 days**



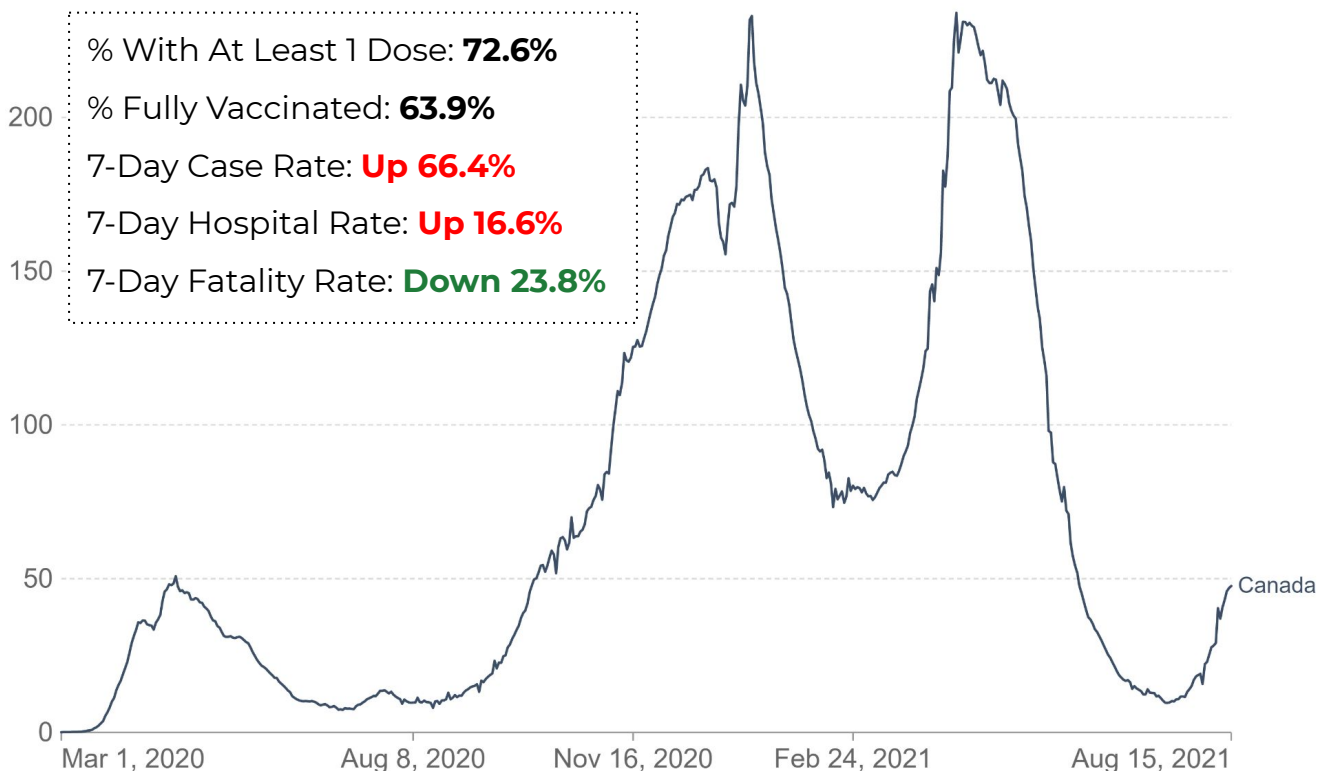
Source: Covid Tracking Project; NYT & CDC—August 16, 2021

# Canadian Covid-19 Trends

# Canadian COVID Trends

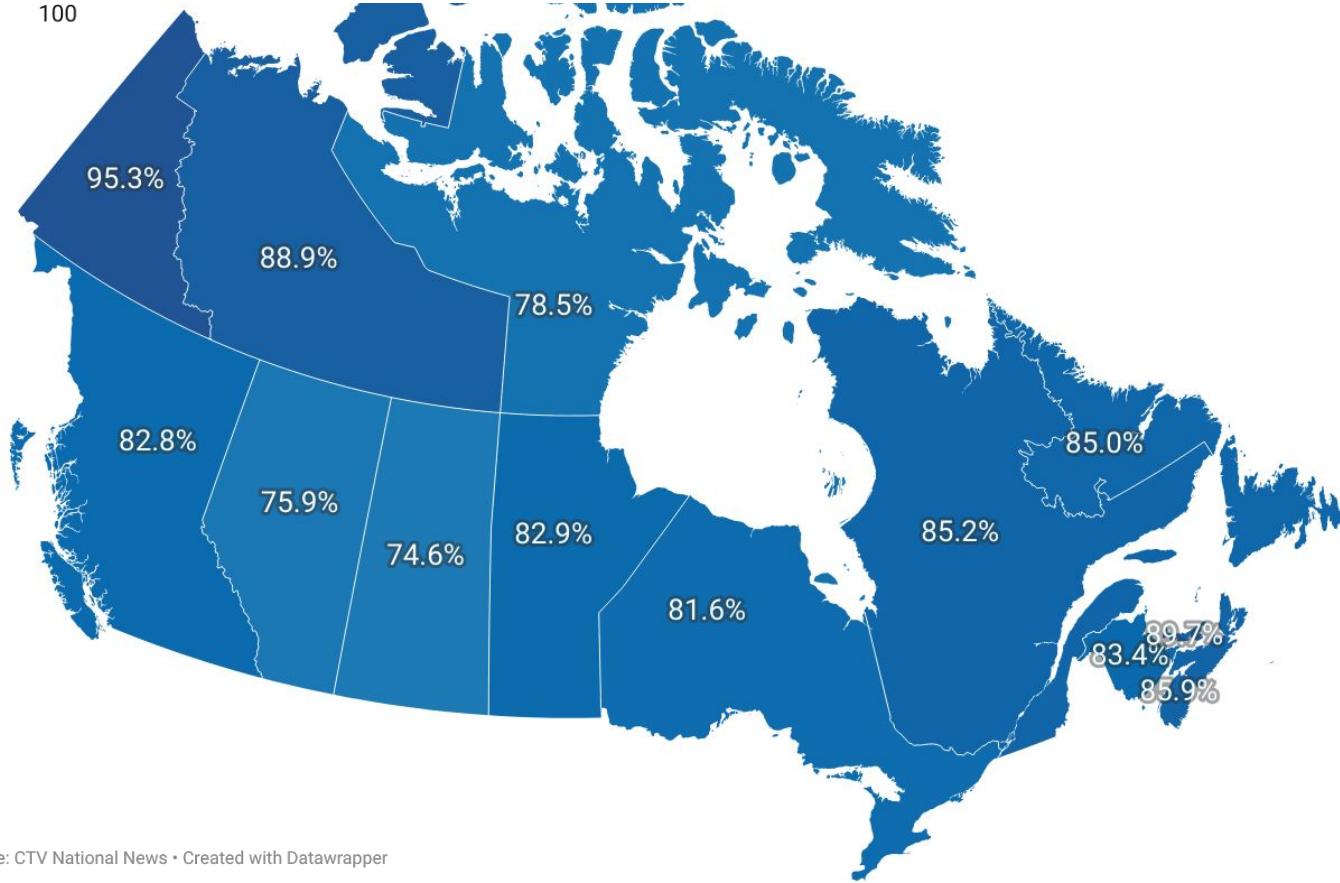
## Daily new confirmed COVID-19 cases per million people

Shown is the rolling 7-day average. The number of confirmed cases is lower than the number of actual cases; the main reason for that is limited testing.



# Canadian Province Vaccination Progress

Percent Eligible (12+) with at least 1 dose



# RESTART VERMONT

## Reopening Metrics

1. Syndromic Surveillance (*retired*)
2. Viral Growth & Reproductive Rates
3. Percentage of New Positive Tests
4. Hospital & Critical Care Bed Capacity



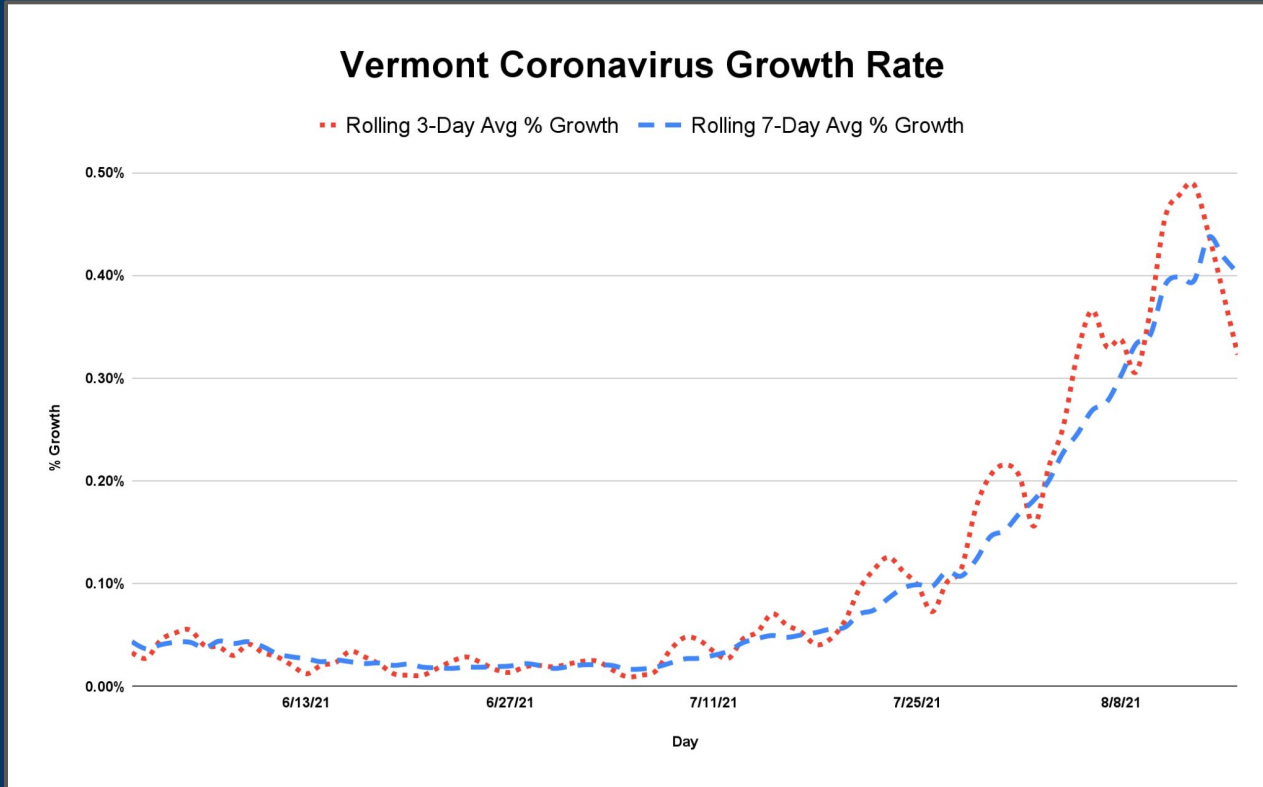
## Data Point 1: Syndromic Surveillance

- **Summary:** Percentage of visits with COVID-19 like illness and Influenza diagnosis
- **Warning Flag:** Percentage of visits exceeding 4% for multiple consecutive days

*Vermont Department of Health no longer updating syndromic surveillance on a weekly basis.*

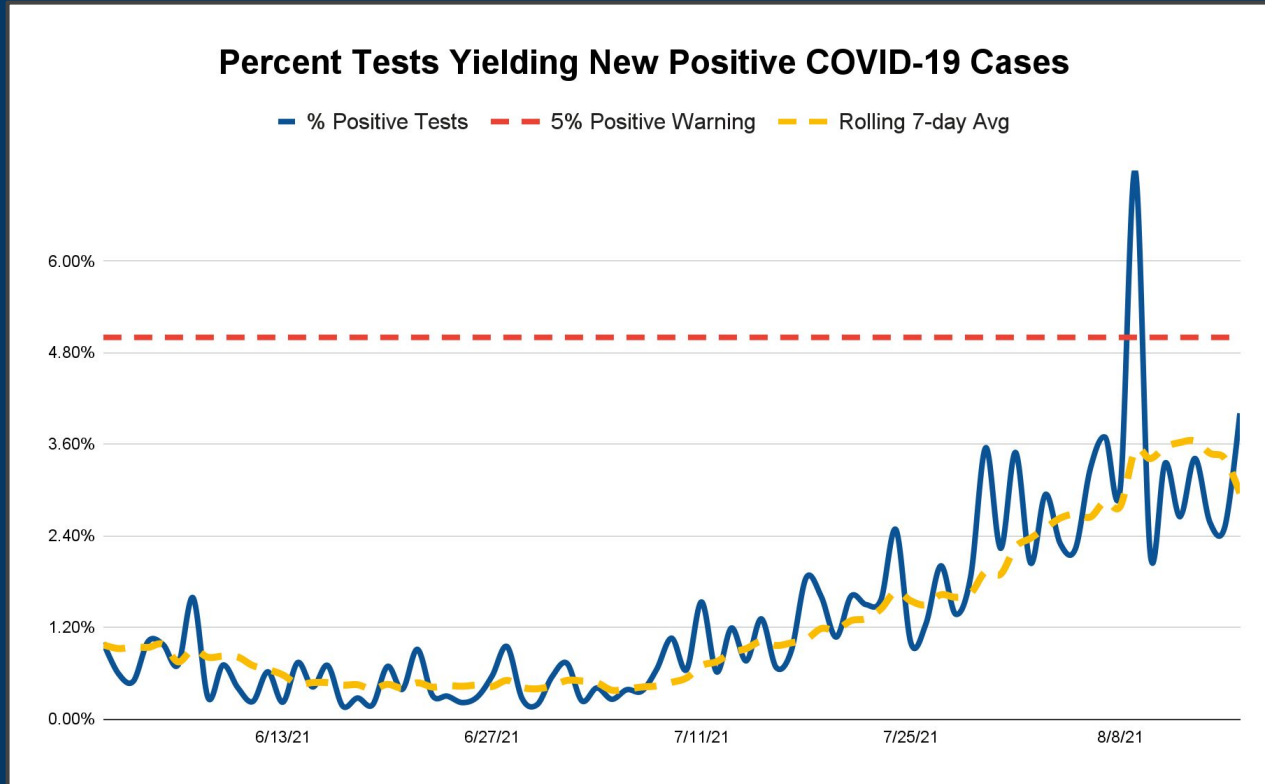
# Data Point 2: Viral Growth and Reproductive Rates

- **Summary:** Case growth measured by daily, 3-day, 7-day, and effective reproductive rate ( $R_t$ )
- **Warning Flags:** Sustained viral growth that would lead to <30% open ICU beds



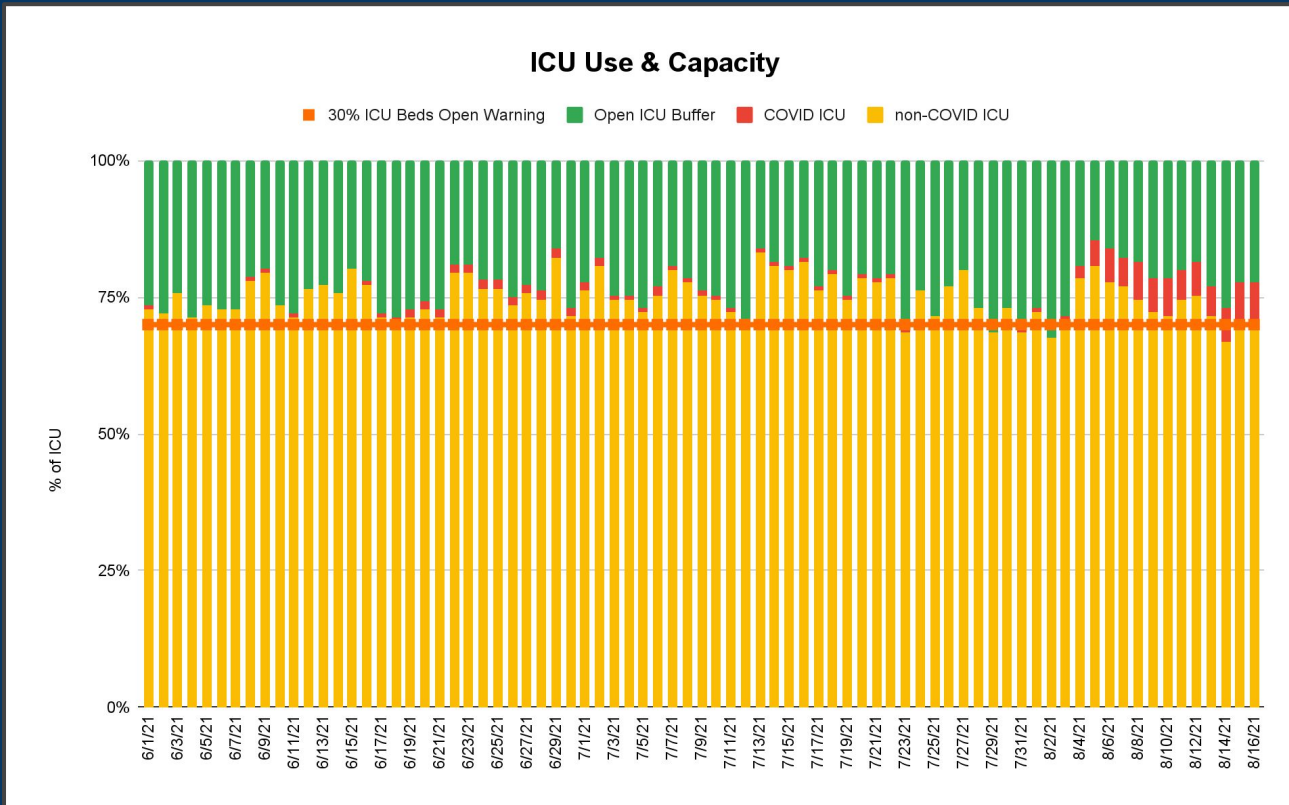
# Data Point 3: Percentage of New Positive Tests

- **Summary:** Percent of tests resulting in a new positive case
- **Warning Flags:** New positives represent >5% of daily results



# Data Point 4: Hospital & Critical Care Beds

- **Summary:** Number of occupied and unoccupied medical surgical and ICU beds
- **Warning Flags:** Reduction in ICU open beds to less than 30%



# Vermont Testing

