

# **COVID-19 Modeling**

## **December 7, 2021**

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

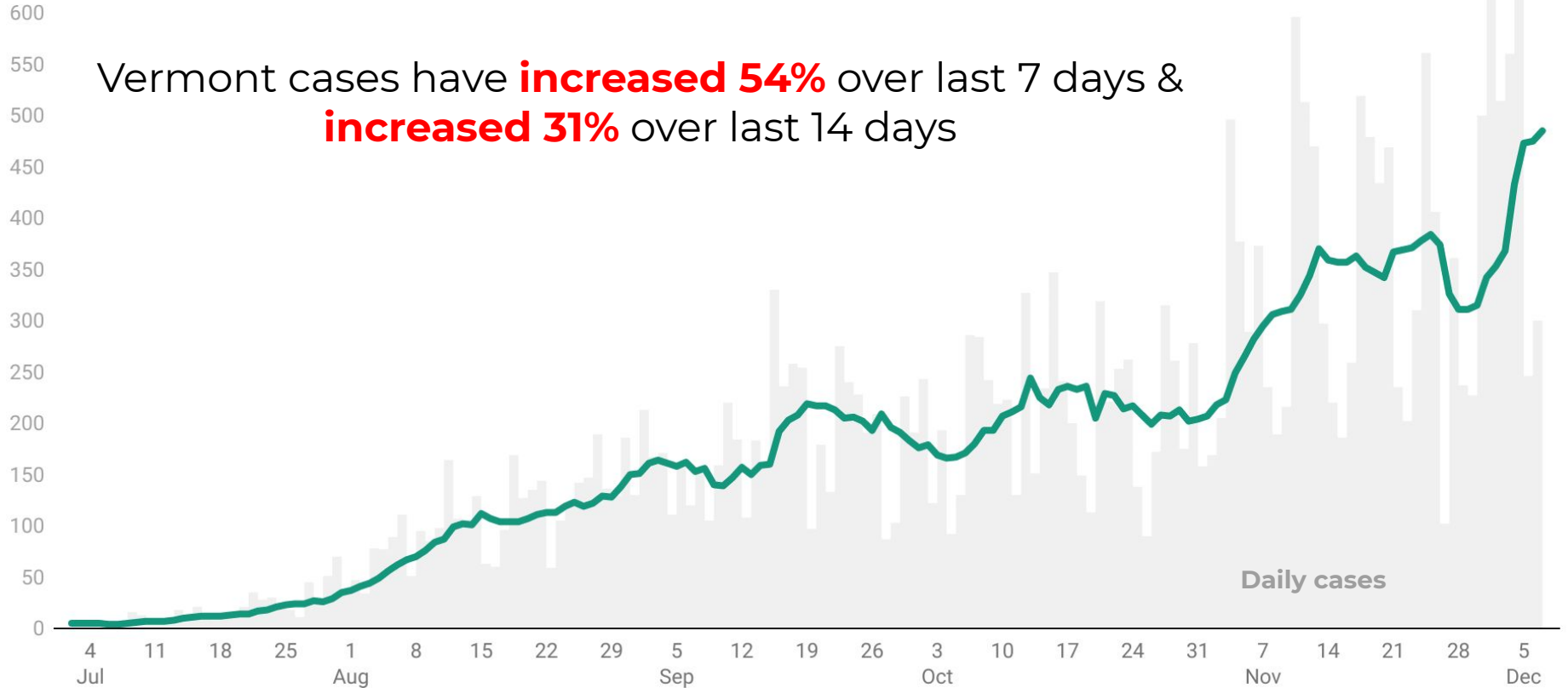
# Table of Contents

Vermont Case Data	Pg. 3
Vermont Hospitalization Data	Pg. 29
Vermont Fatality Data	Pg. 34
Vermont Vaccination Data	Pg. 38
Regional Data	Pg. 44
National Data	Pg. 50
Restart Vermont	Pg. 56

# Vermont Case Data

# Vermont New COVID-19 Cases

7-Day Average

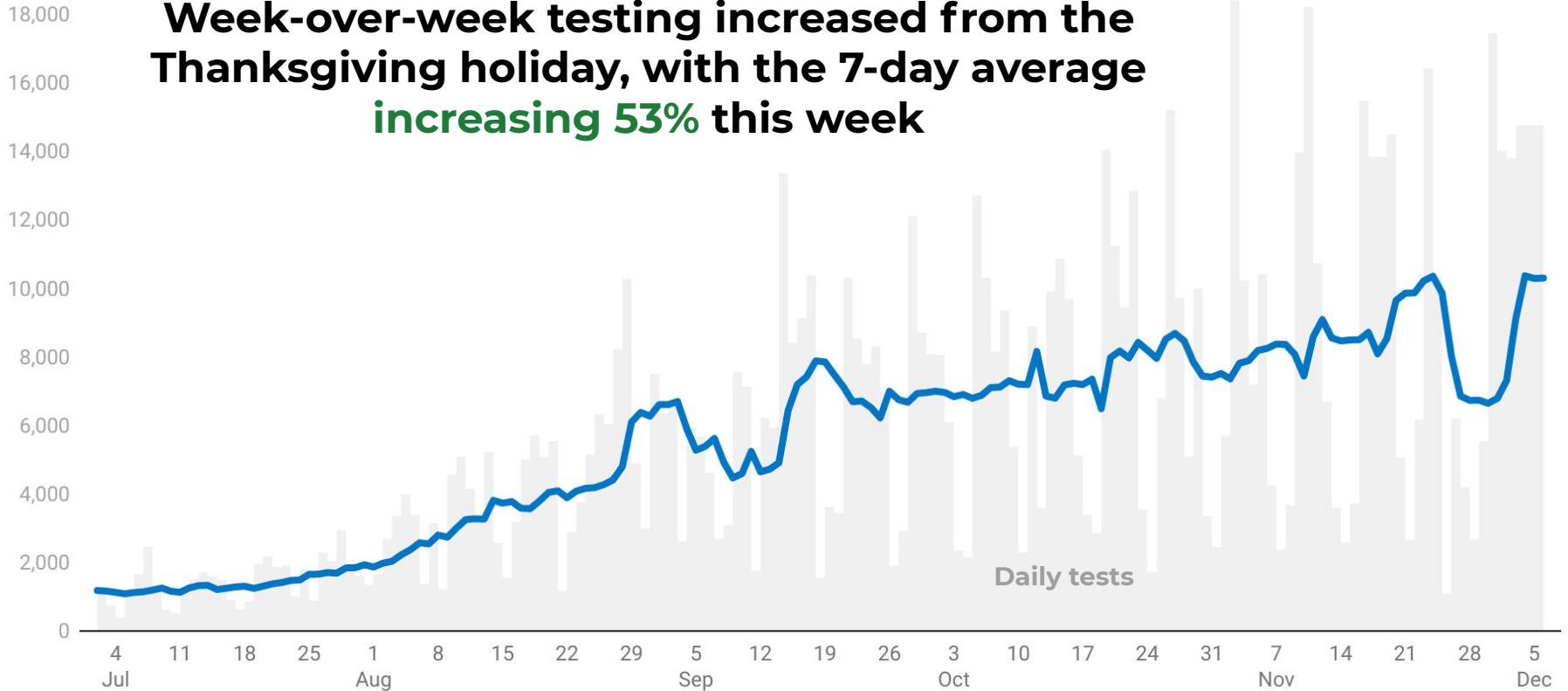


# Vermont COVID-19 Testing

— 7-Day Average

**Week-over-week testing increased from the Thanksgiving holiday, with the 7-day average increasing 53% this week**

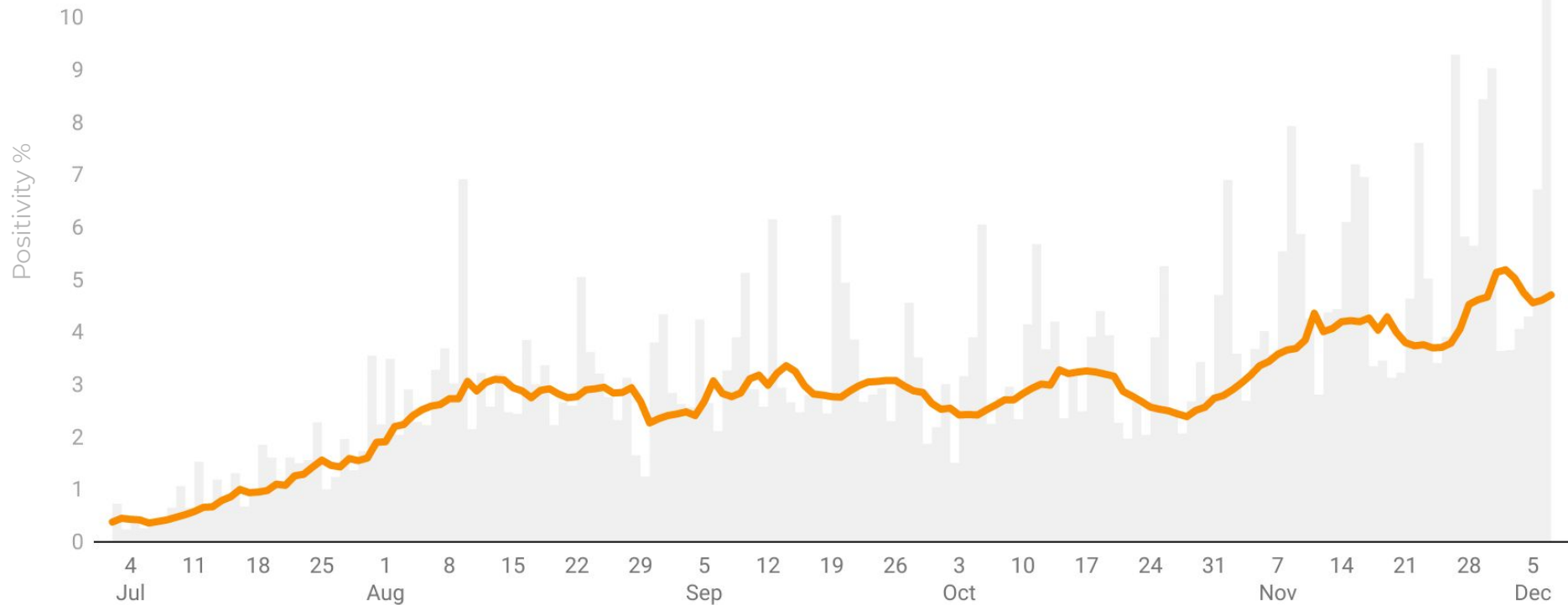
Number of Tests



Daily tests

# Vermont Test Positivity: Delta Wave

7-Day Positivity Rate



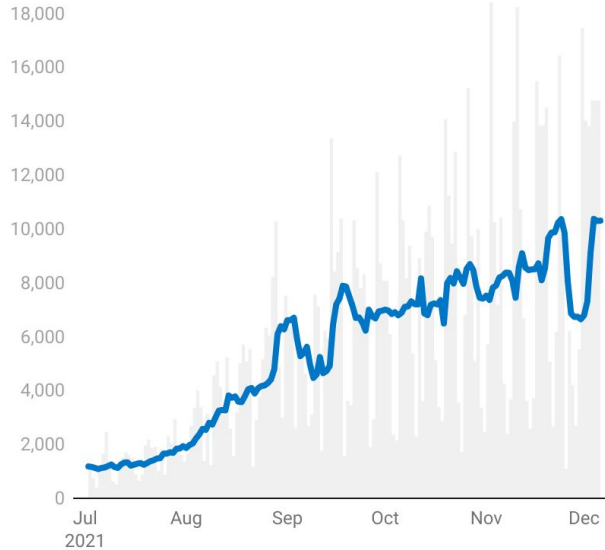
# Vermont Case Growth Metrics

**54% Increase**  
Over last 7 days



**Infections**

**53% Increase**  
Over last 7 days



**Testing**

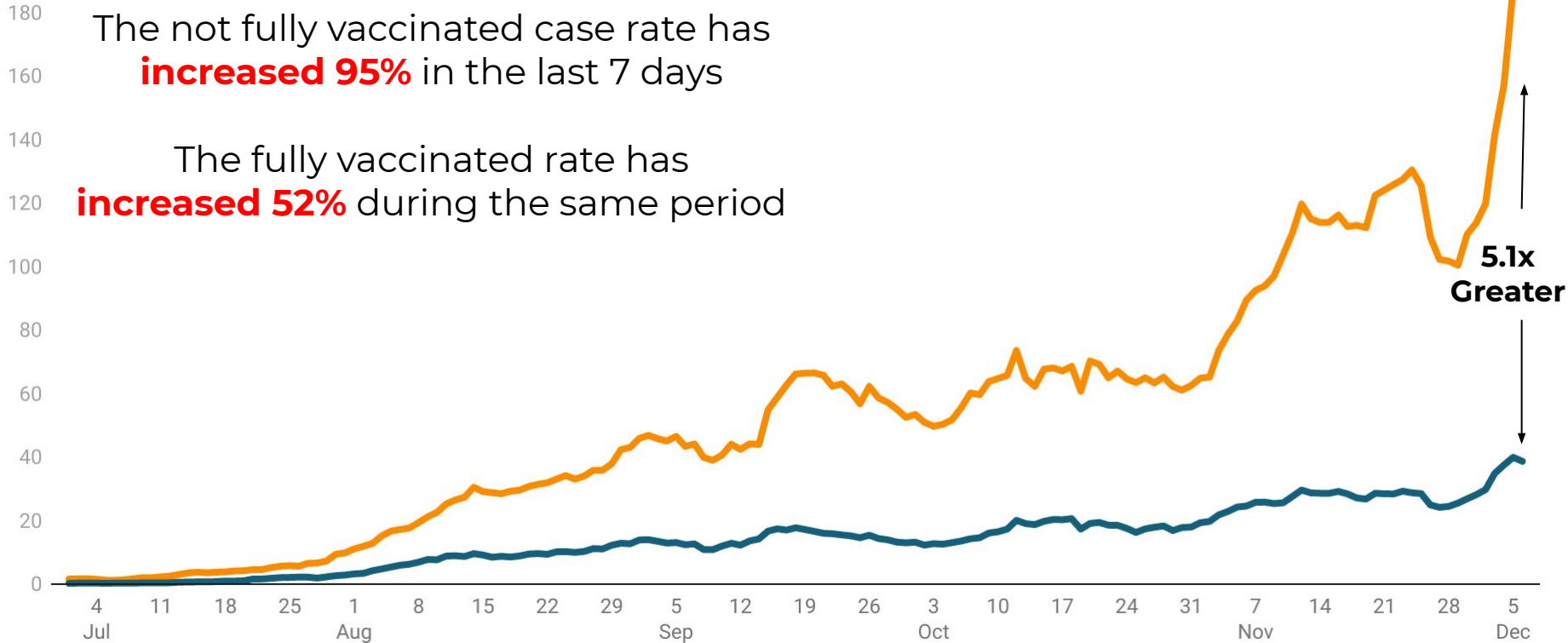
**1% Increase**  
Over last 7 days



**Positivity Rate**

# Vermont COVID-19 New Case Rates Per 100K (7-Day Average)

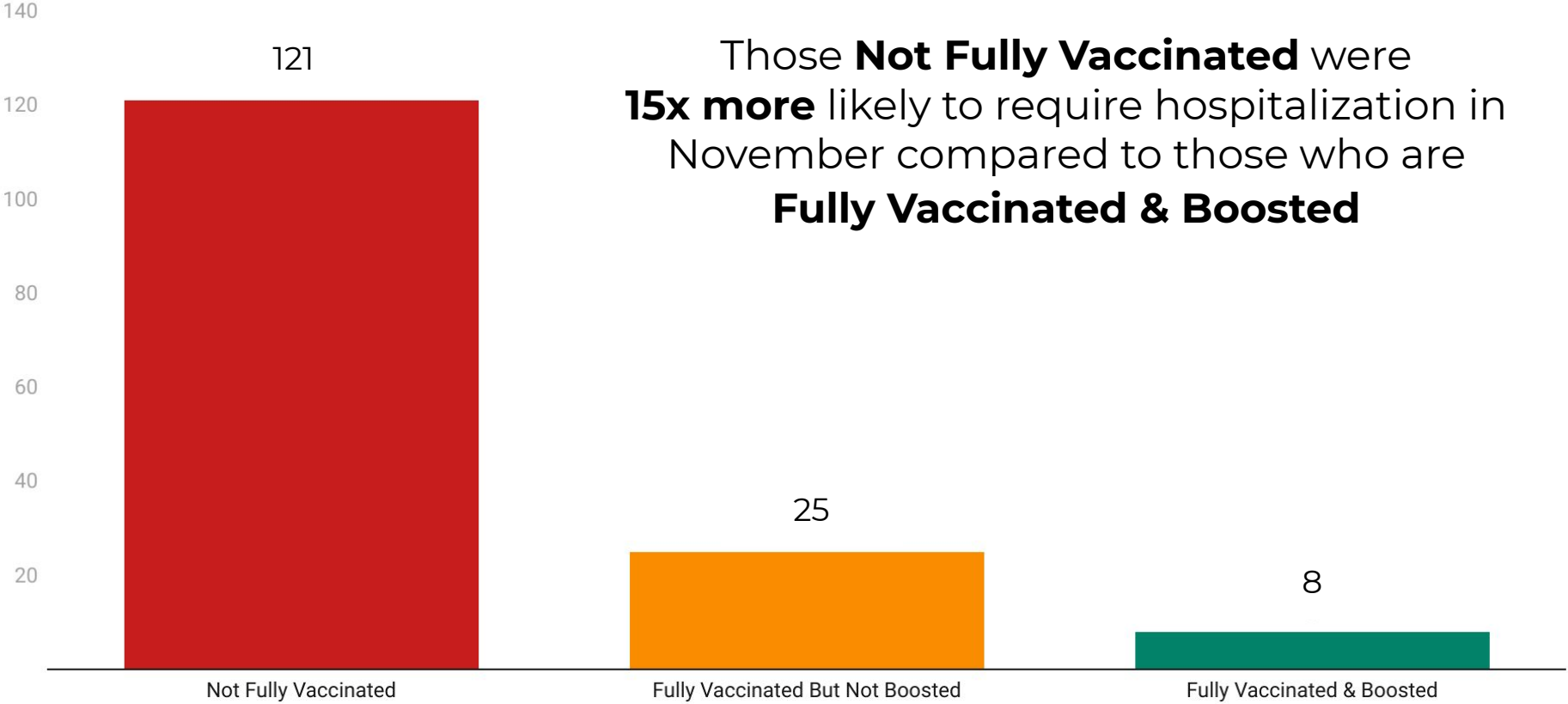
Not Fully Vaccinated Case Rate Fully Vaccinated Case Rate





# November Hospitalizations by Vaccination Status Per 100K

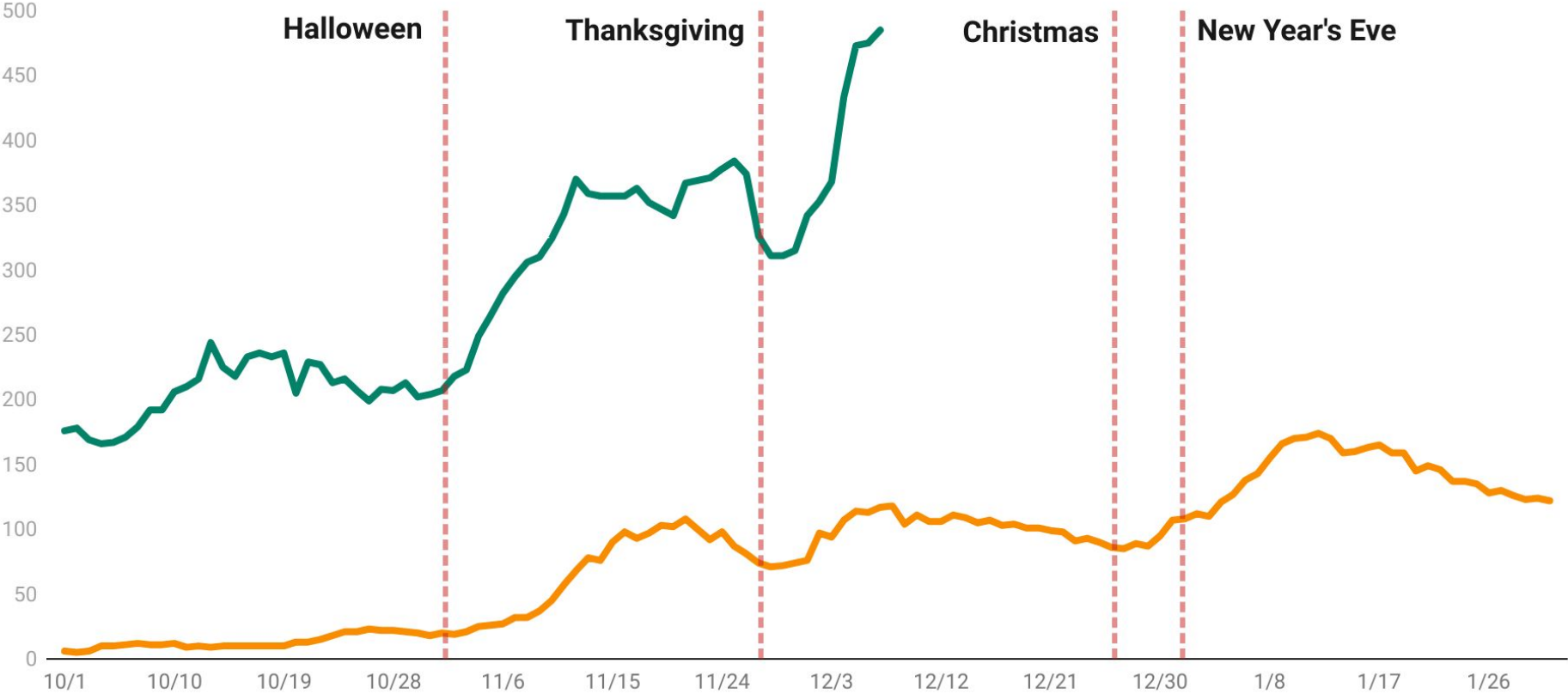
Measured Among Vermont's 18 & Over Population



Source: VDH & CDC—December 6, 2021; Created with Datawrapper

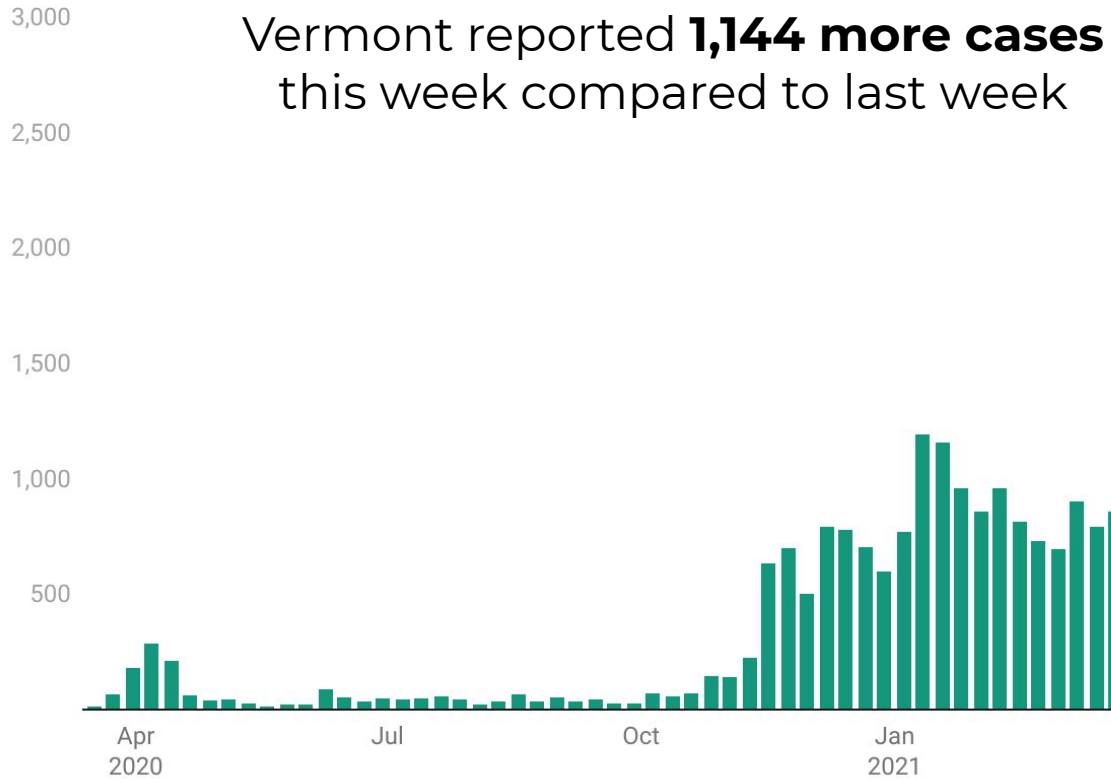
# Vermont COVID-19 Cases Fall 2020 vs. Fall 2021

Fall 2021 Fall 2020



Source: Vermont Dept. of Health—December 6, 2021; created with Datawrapper

# Vermont New Weekly COVID-19 Cases



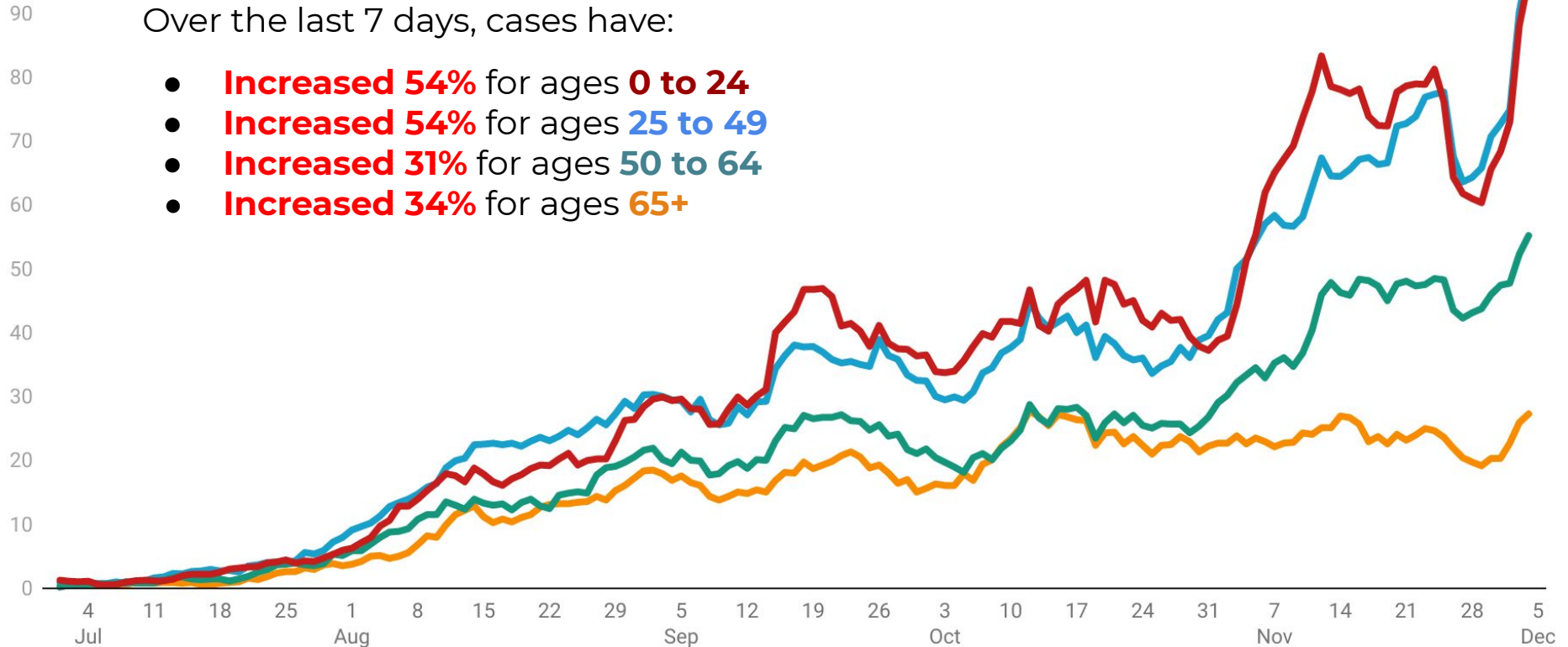
Source: VDH—December 7, 2021; created with Datawrapper

# Vermont Case Rates Per 100K By Age (7-Day Average)

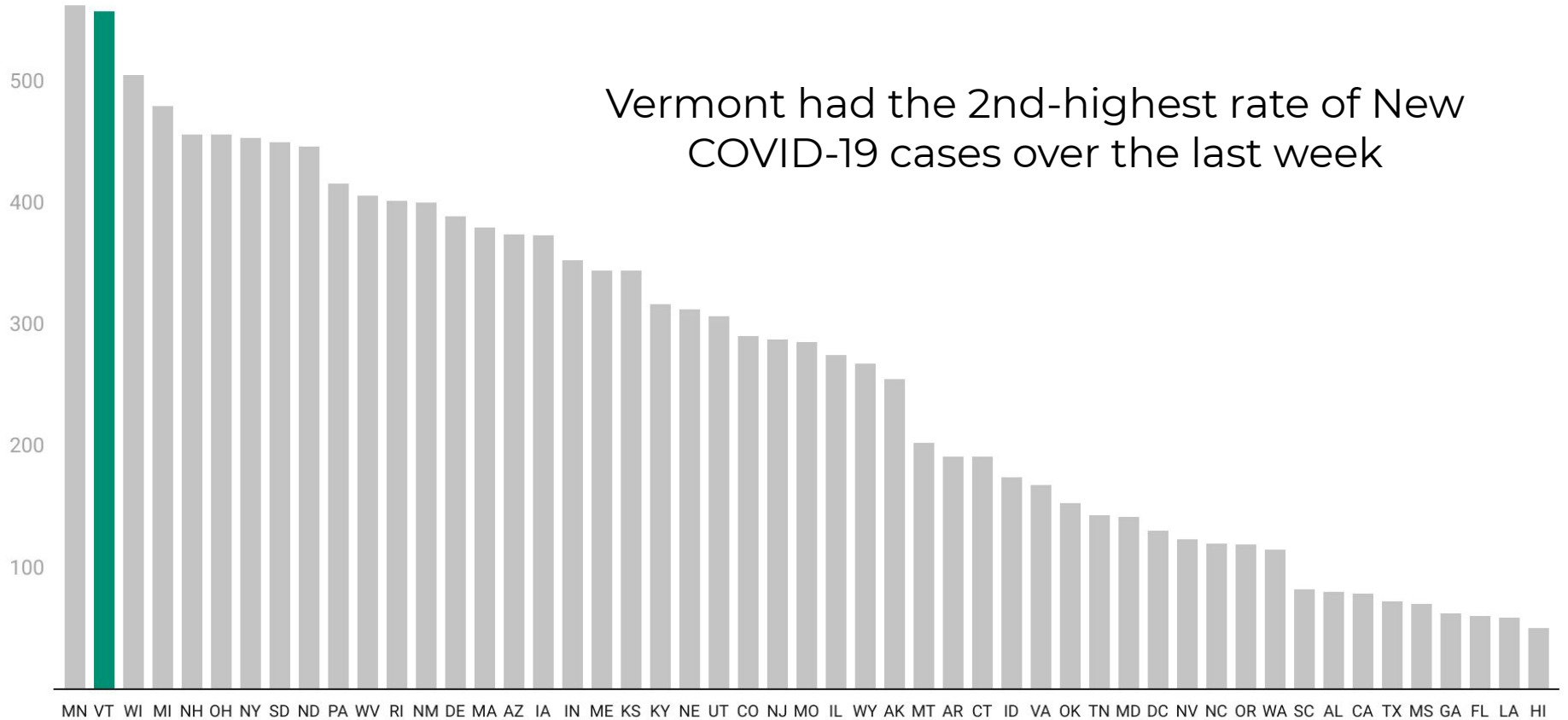
0 to 24 24 to 49 50 to 64 65+

Over the last 7 days, cases have:

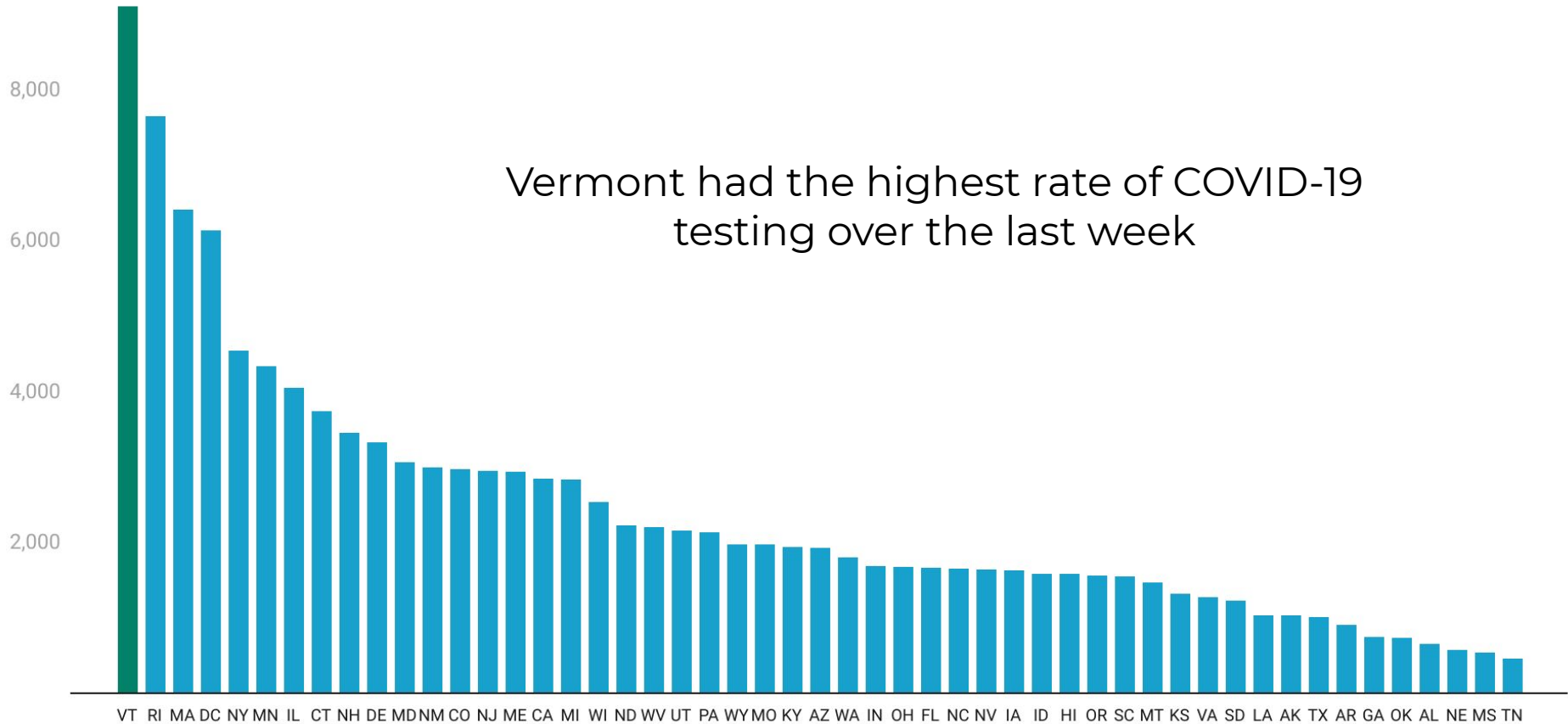
- **Increased 54%** for ages **0 to 24**
- **Increased 54%** for ages **25 to 49**
- **Increased 31%** for ages **50 to 64**
- **Increased 34%** for ages **65+**



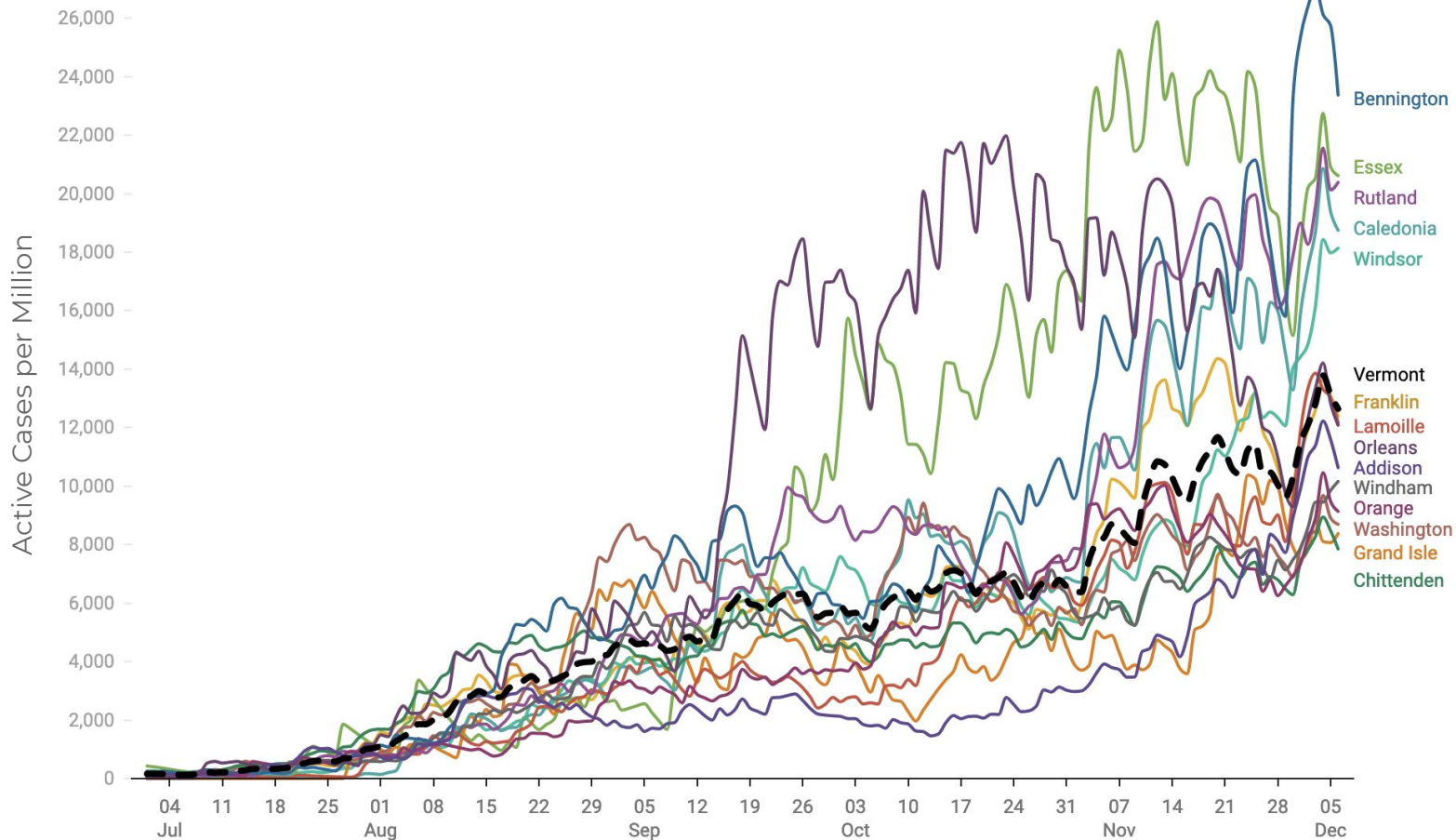
# National COVID-19 Case Rates Per 100K Last 7 Days



# COVID-19 Testing Per 100K Last 7 Days



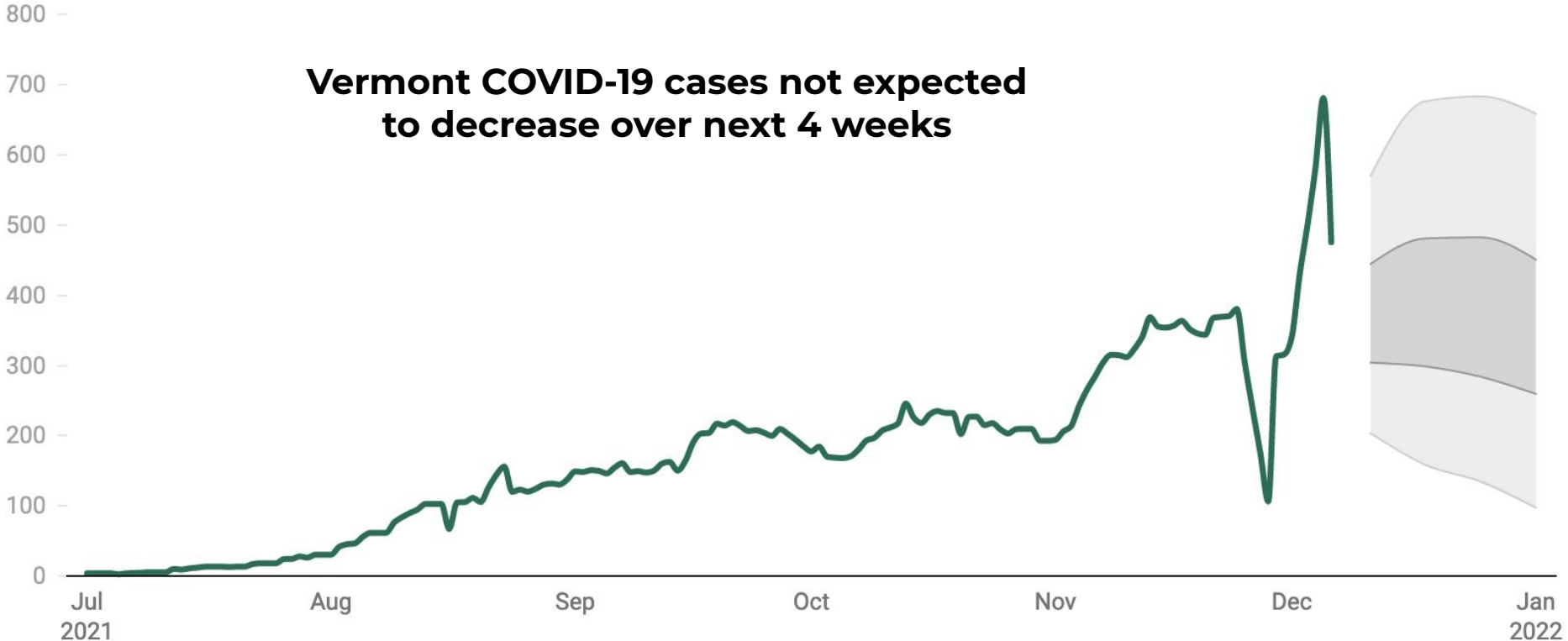
# Active Cases in Vermont Counties



Source: JHU—November 30, 2021; DFR Active Case Algorithm (per million)

# VT COVID-19 Infection Confidence Intervals

Calculated as a 7-day mean. Inner and outer bands represent 50% and 95% confidence intervals, respectively.

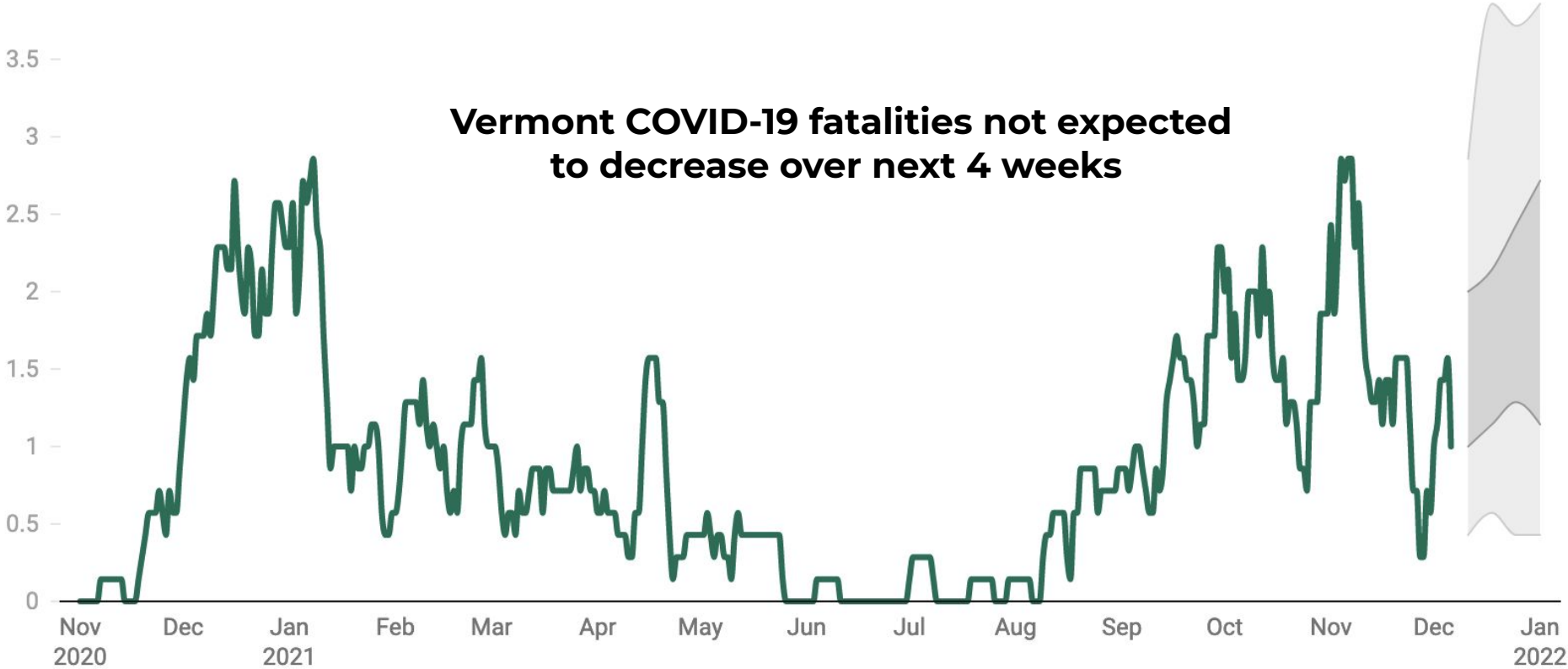


Source: Johns Hopkins University & CDC—November 30, 2021



# VT COVID-19 Death Confidence Intervals

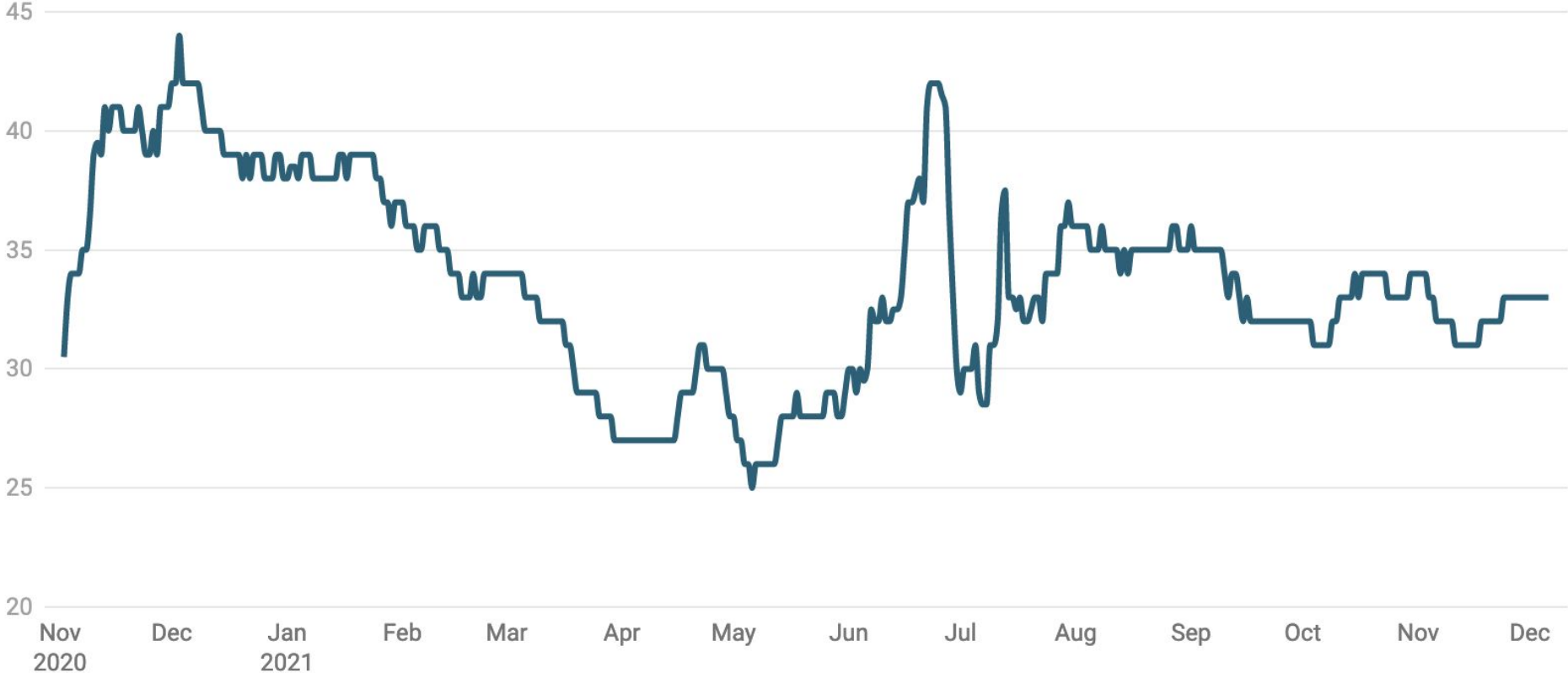
Calculated as a 7-day mean. Inner and outer bands represent 50% and 95% confidence intervals, respectively.



Source: Johns Hopkins University & CDC—November 30, 2021

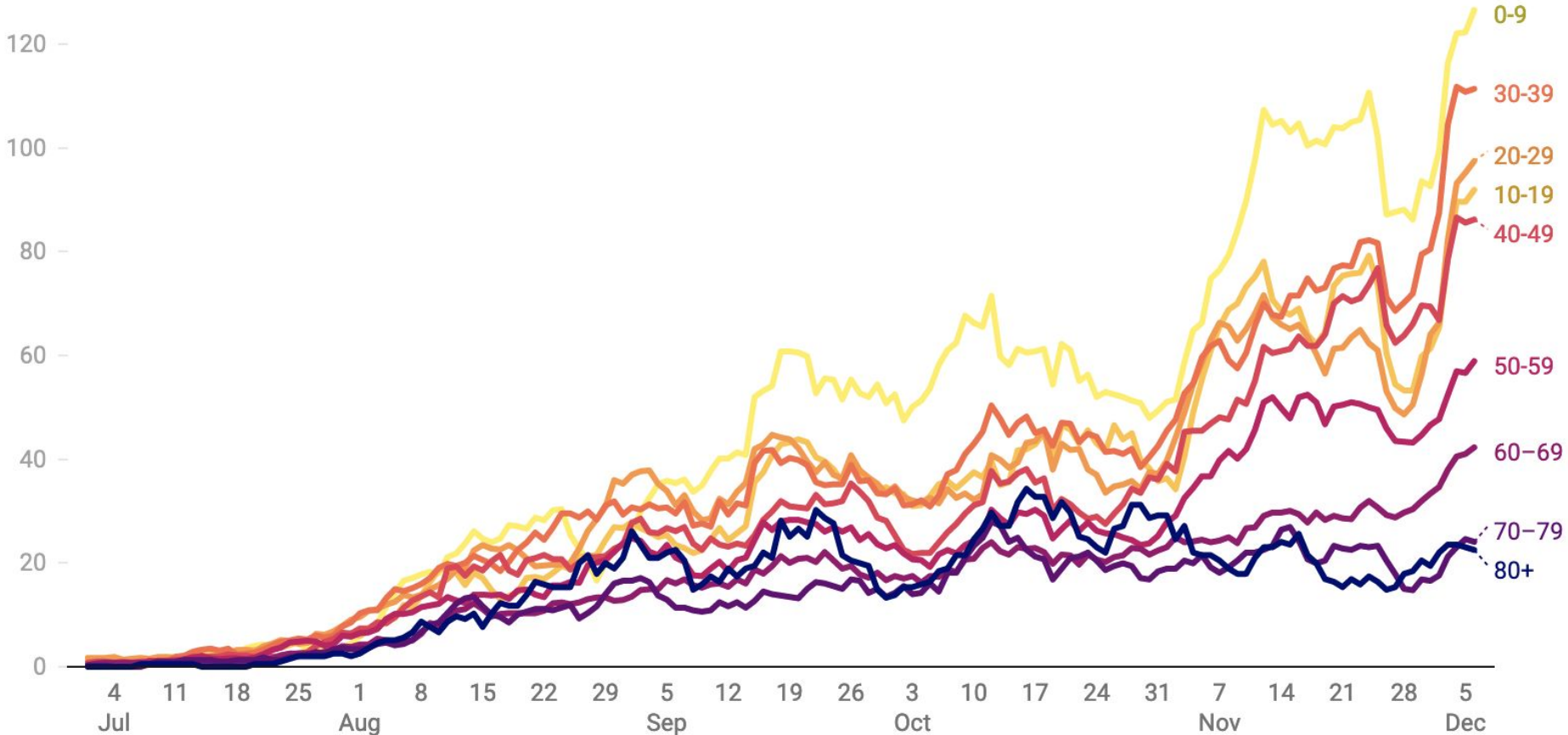
# Age of Infected Vermonters

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



Source: VDH—November 30, 2021

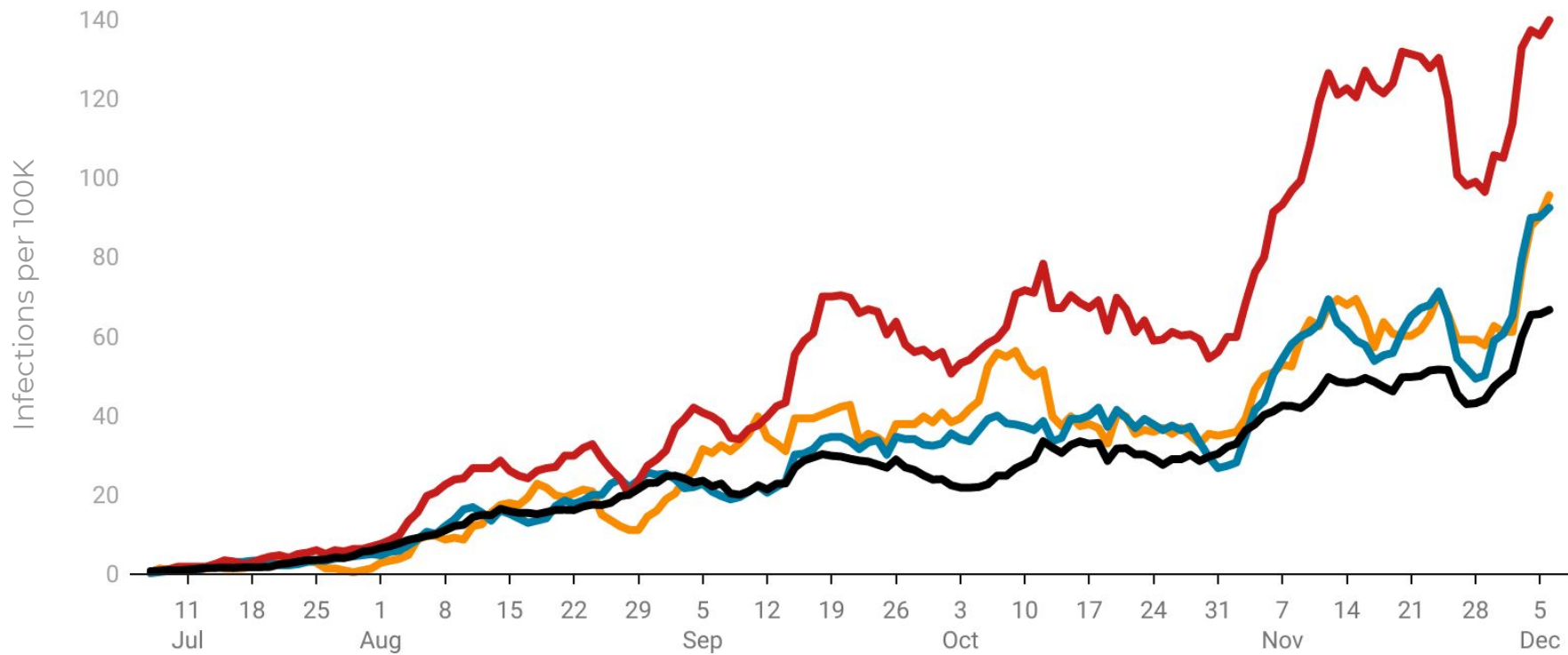
# VT COVID-19 Infections per 100K by Age Group



Source: VDH—November 30, 2021

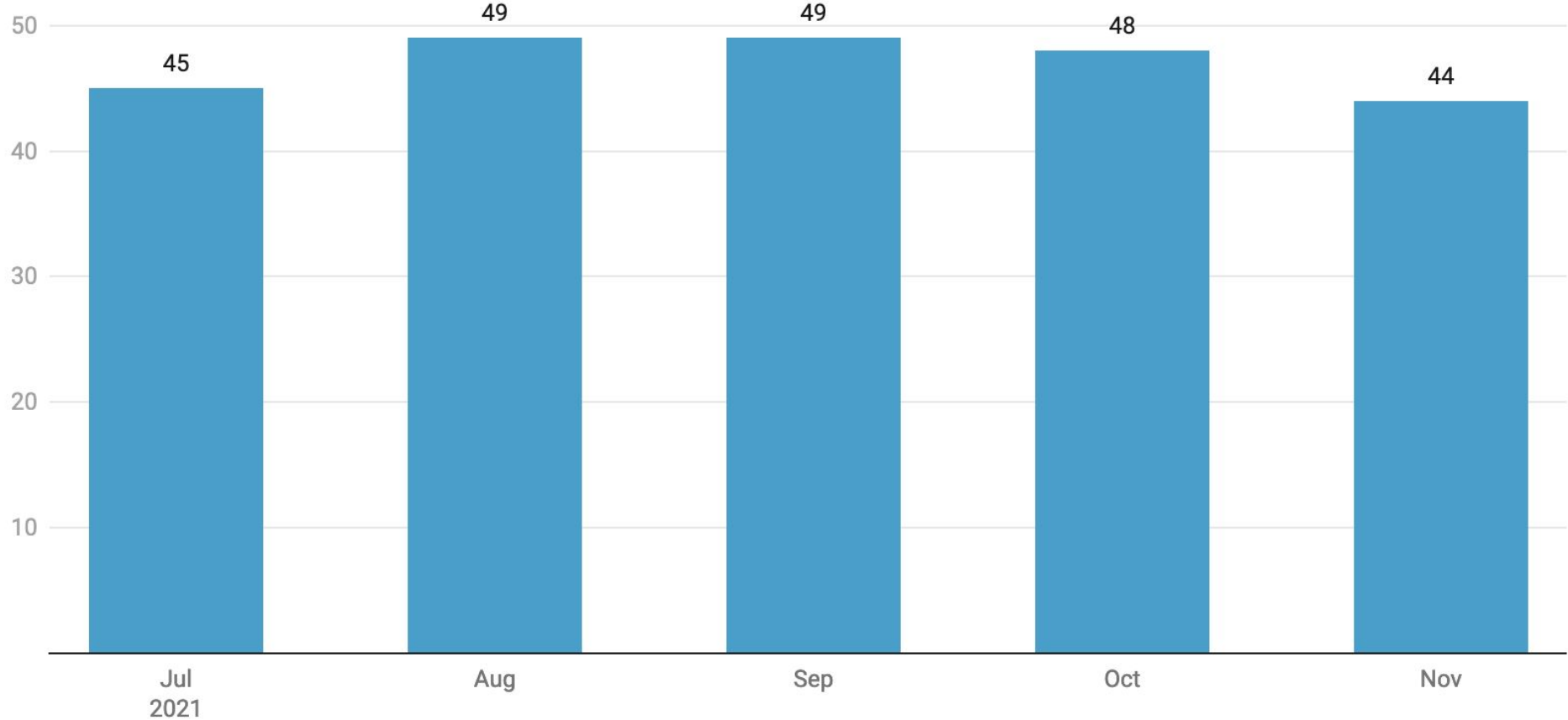
# Vermont Covid-19 Case Rates by Age (7-Day Average)

0-4 5-11 12-18 19+



Source: VDH—December 6, 2021; created with Datawrapper

# Median Age of VT Breakthrough Infections by Month

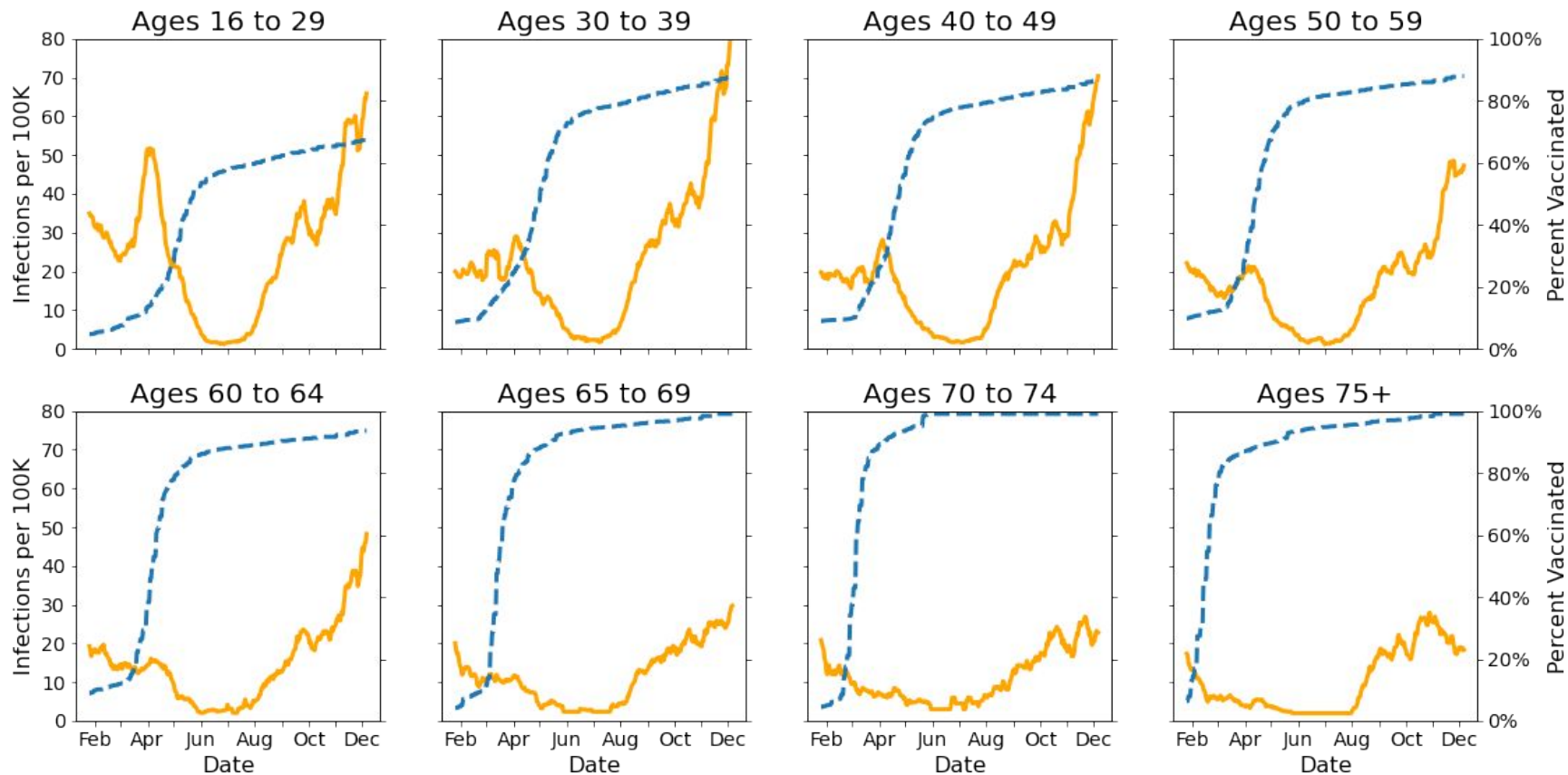


Source: Vermont Dept. of Health—November 29, 2021; created with Datawrapper

# Vermont Case Rate & Vaccination by Age Band

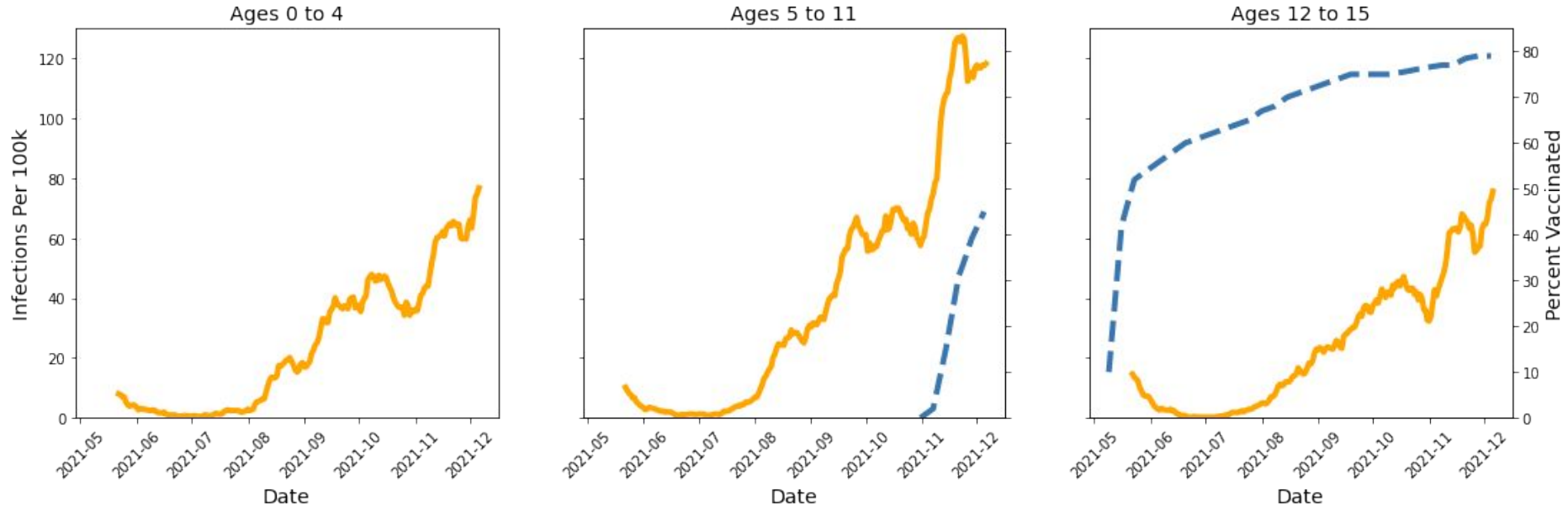
— New Infections per 100K (14-Day Average)

— Percent Received First Vaccine Dose



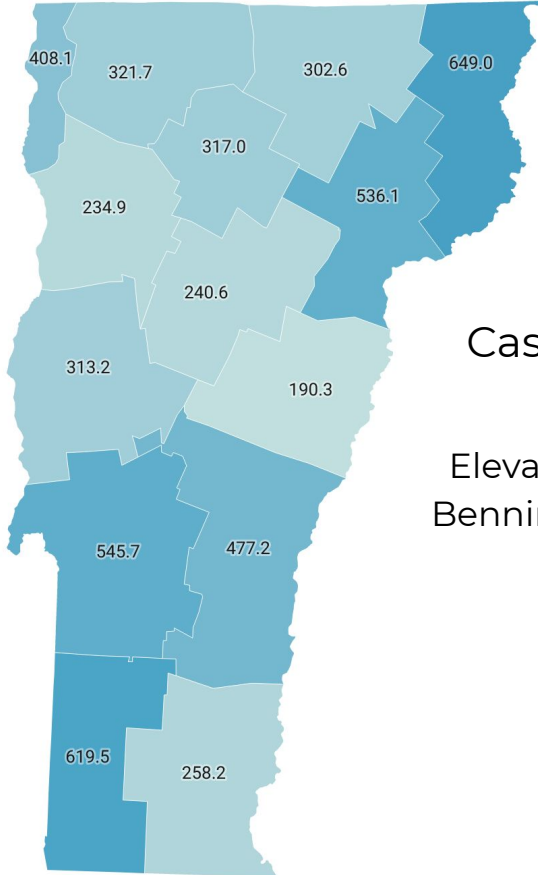
# Vermont Case Rate & Vaccination by Age Band

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



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

Results Reported November 23 to 29

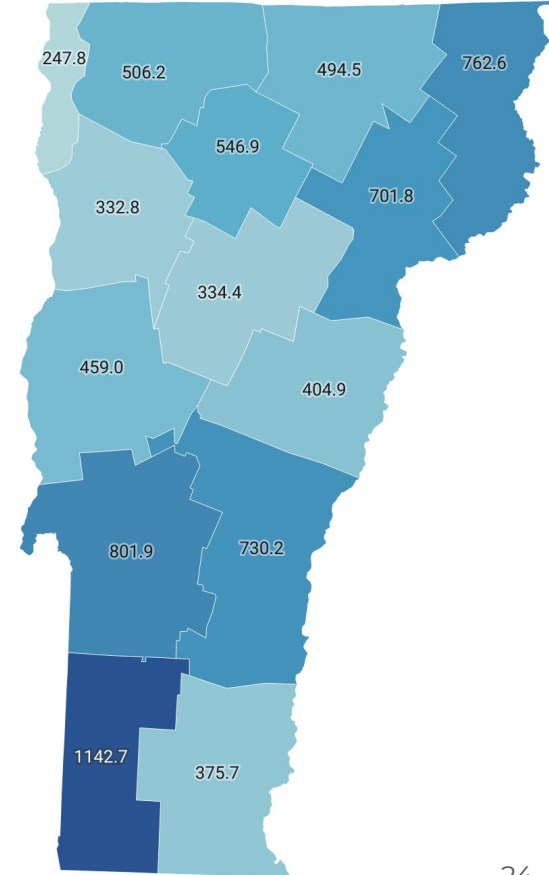


Case rates **increased in 13 of 14** counties this week

Elevated case rates across Vermont, with Bennington reporting highest rates, nearly doubling in the past week

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

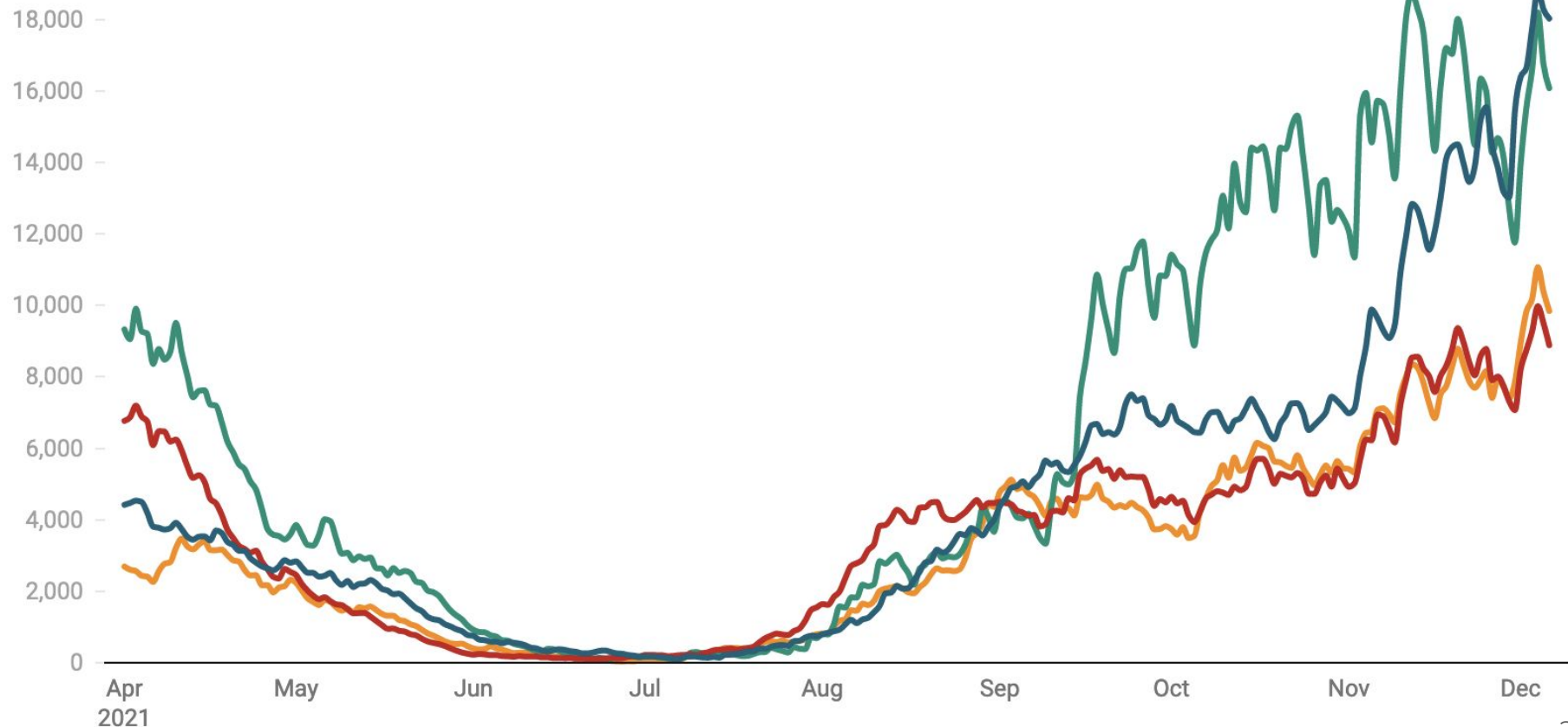
Results Reported November 30 to December 6





# Active Cases per Million in Vermont Regions

— Burlington Metro — Northeast Kingdom — Central VT — Southern VT



Source: JHU & DFR Active Case Algorithm—November 30, 2021

# Fall 2021 Higher Education Restart

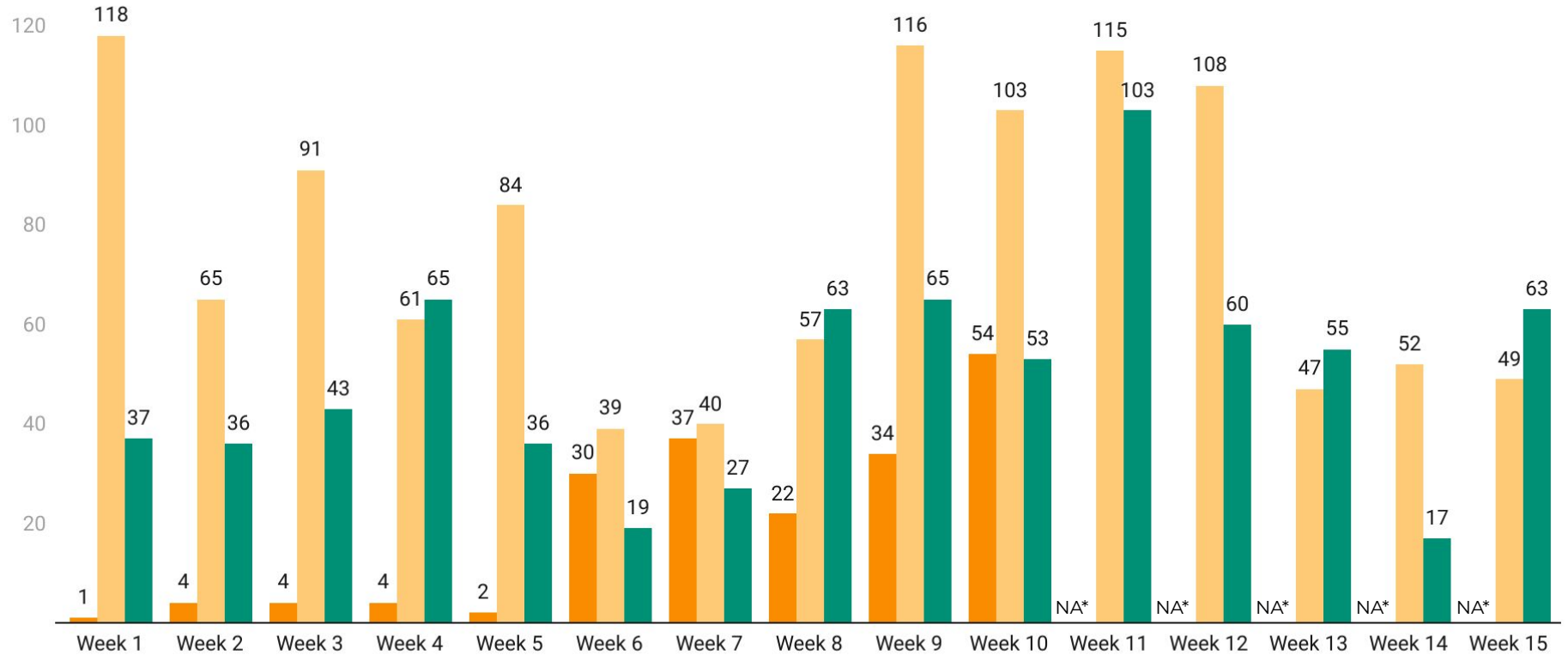
Higher Education Institutions Reporting	Enrollment	Students Fully Vaccinated	Students Not Fully Vaccinated (No Exemption Granted)	Students with Unknown Vaccine Status	Students Granted Vaccine Mandate Exemption
16 of 16	28,586	27,201	255	445	685
		95.2%	0.9%	1.6%	2.4%

Week 1: **37 cases** out of 12,623 tests  
Week 2: **36 cases** out of 7,434 tests  
Week 3: **43 cases** out of 3,053 tests  
Week 4: **65 cases** out of 6,497 tests  
Week 5: **36 cases** out of 4,878 tests  
Week 6: **19 cases** out of 4,516 tests  
Week 7: **27 cases** out of 3,536 tests  
Week 8: **63 cases** out of 3,668 tests

Week 8: **63 cases** out of 3,668 tests  
Week 9: **65 cases** out of 4,398 tests  
Week 10: **53 cases** out of 4,575 tests  
Week 11: **132 cases** out of 8,404 tests  
Week 12: **60 cases** out of 6,048 tests  
Week 13: **55 cases** out of 6,029 tests  
Week 14: **17 cases** out of 2,066 tests  
Week 15: **63 cases** out of 8,141 tests

# Vermont Higher Education Cases By Semester

Fall 2020 Spring 2021 Fall 2021



Source: Vermont Higher Education Institutions—December 6, 2021—Created with Datawrapper; \* During the Fall 2020 semester Week 1 started later than Spring and Fall 2021 and therefore reached Thanksgiving Break by Week 11.

# Active Outbreaks in Long Term Care Facilities

Facility Name	Total COVID-19 Cases
The Meadows, <i>Rutland</i>	10
Centers for Living & Rehabilitation, <i>Bennington</i>	10
Barre Gardens	6
Valley Vista, <i>Vergennes</i>	6
The Manor, <i>Morrisville</i>	6
Elderwood at Burlington	Not Shown
Mountain View Center, <i>Rutland</i>	Not Shown
<b>Total</b>	<b>38</b>

Source: Vermont Department of Health—December 7, 2021 (reporting Monday through previous Sunday); 'Active' defined as less than 28 days since most recent case's specimen collection date or illness start date (whichever is later); \*privacy suppressions include facility w/ <25 staff and residents and/or >75% of facility infected

# Vermont Hospitalization Data

# Statewide Covid-19 Hospitalizations

100

**18% increase** in the 7-Day hospitalization average over the past week

**74%** of hospitalizations among the unvaccinated over the last 7 days

75

50

25

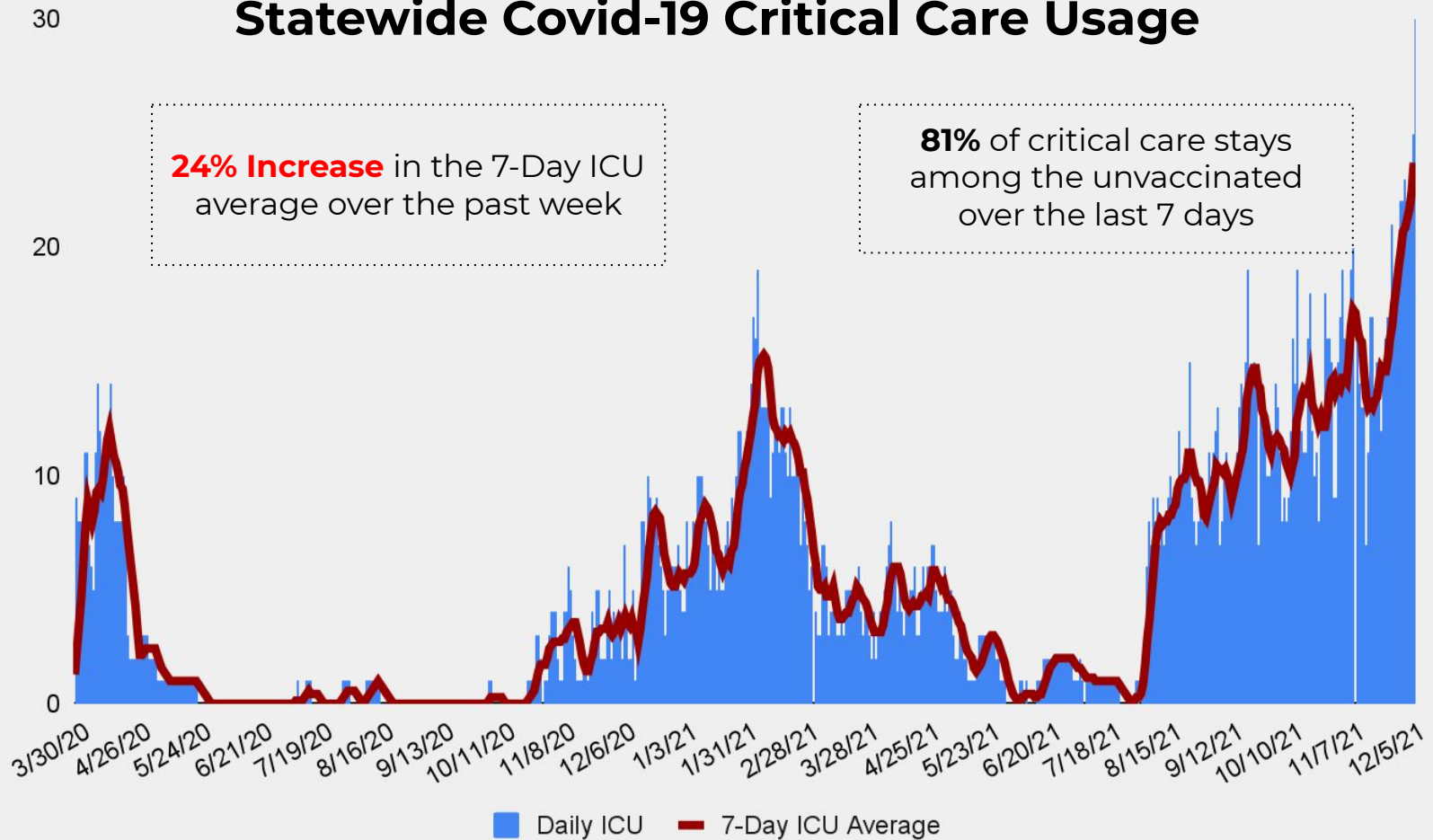
0

3/30/20 4/26/20 5/24/20 6/21/20 7/19/20 8/16/20 9/13/20 10/11/20 11/8/20 12/6/20 1/3/21 1/31/21 2/28/21 3/28/21 4/25/21 5/23/21 6/20/21 7/18/21 8/15/21 9/12/21 10/10/21 11/7/21 12/5/21

■ Daily Hospitalizations ■ 7-Day Hospitalization Average

Source: Vermont Department of Health—November 30, 2021

# Statewide Covid-19 Critical Care Usage



**24% Increase** in the 7-Day ICU average over the past week

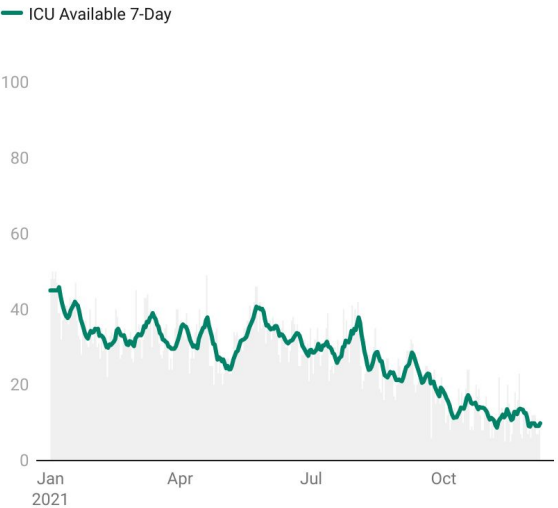
**81%** of critical care stays among the unvaccinated over the last 7 days

■ Daily ICU    — 7-Day ICU Average

Source: Vermont Department of Health—November 30, 2021

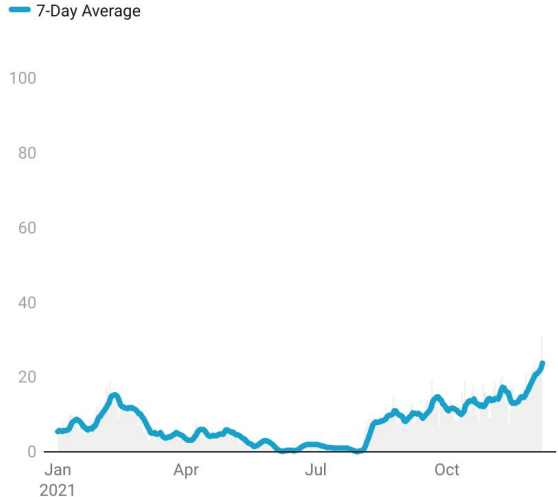
# Vermont ICU Metrics (7-Day Averages)

**9% Increase**  
Over last 7 days



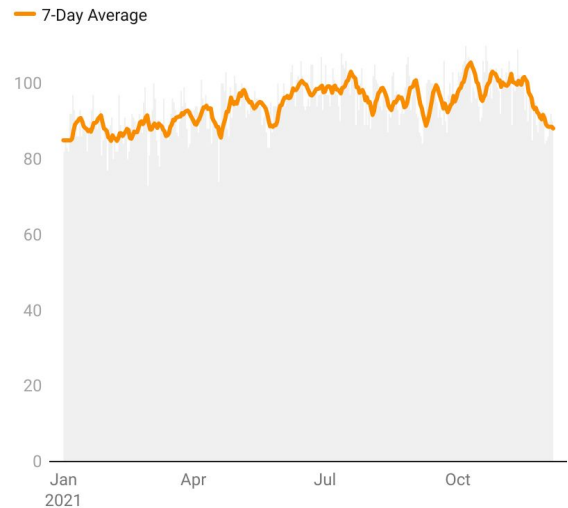
**ICU Beds Available**

**24% Increase**  
Over last 7 days



**COVID-19 ICU Beds Occupied**

**4% Decrease**  
Over last 7 days

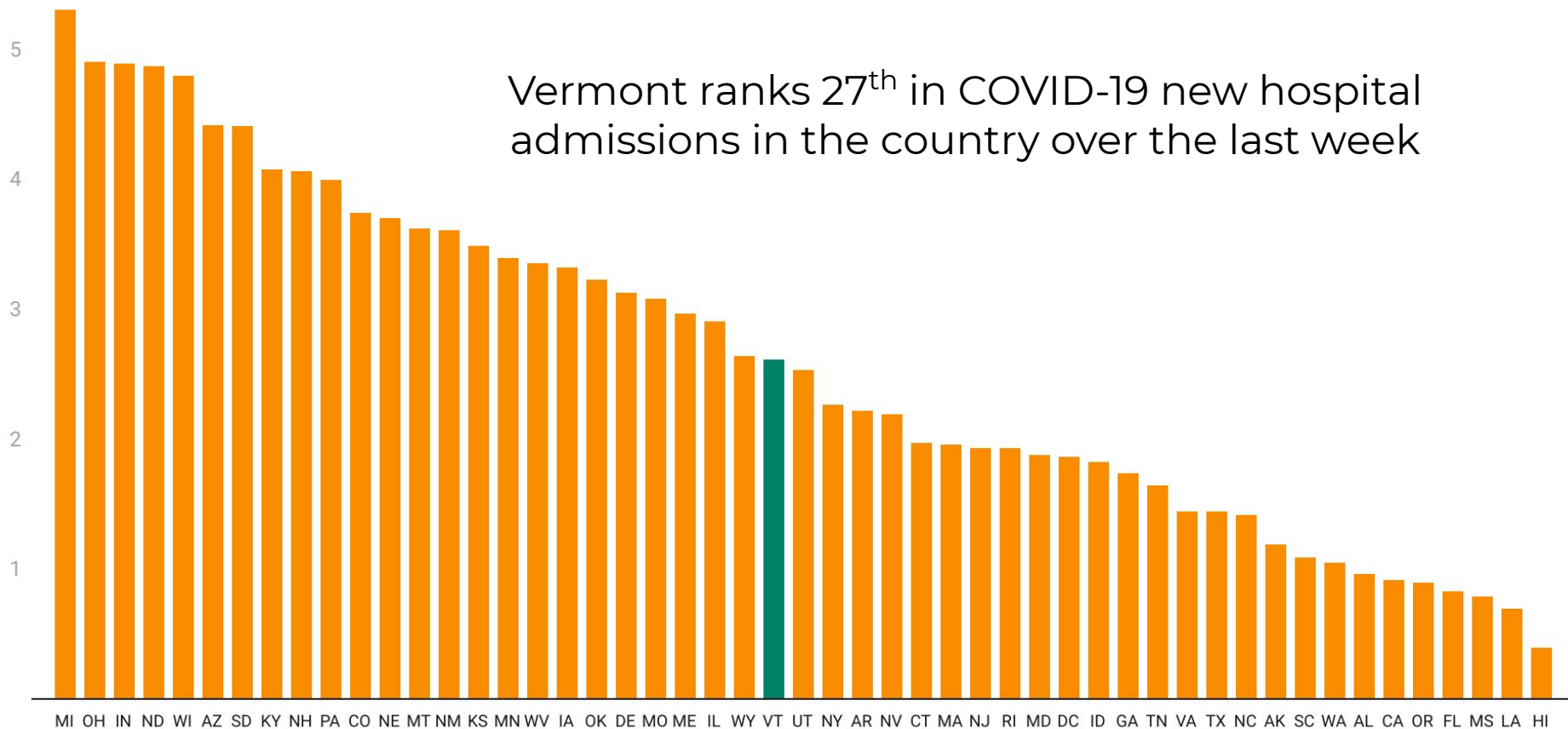


**Non-COVID-19 ICU Beds Occupied**

Source: Vermont Department of Health—December 7, 2021



# COVID-19 Hospital Admissions Last 7 Days Per 100K



# Vermont Fatality Data

# Weekly Covid-19 Deaths In Vermont

20

15

10

5

0

Apr  
2020

Jul

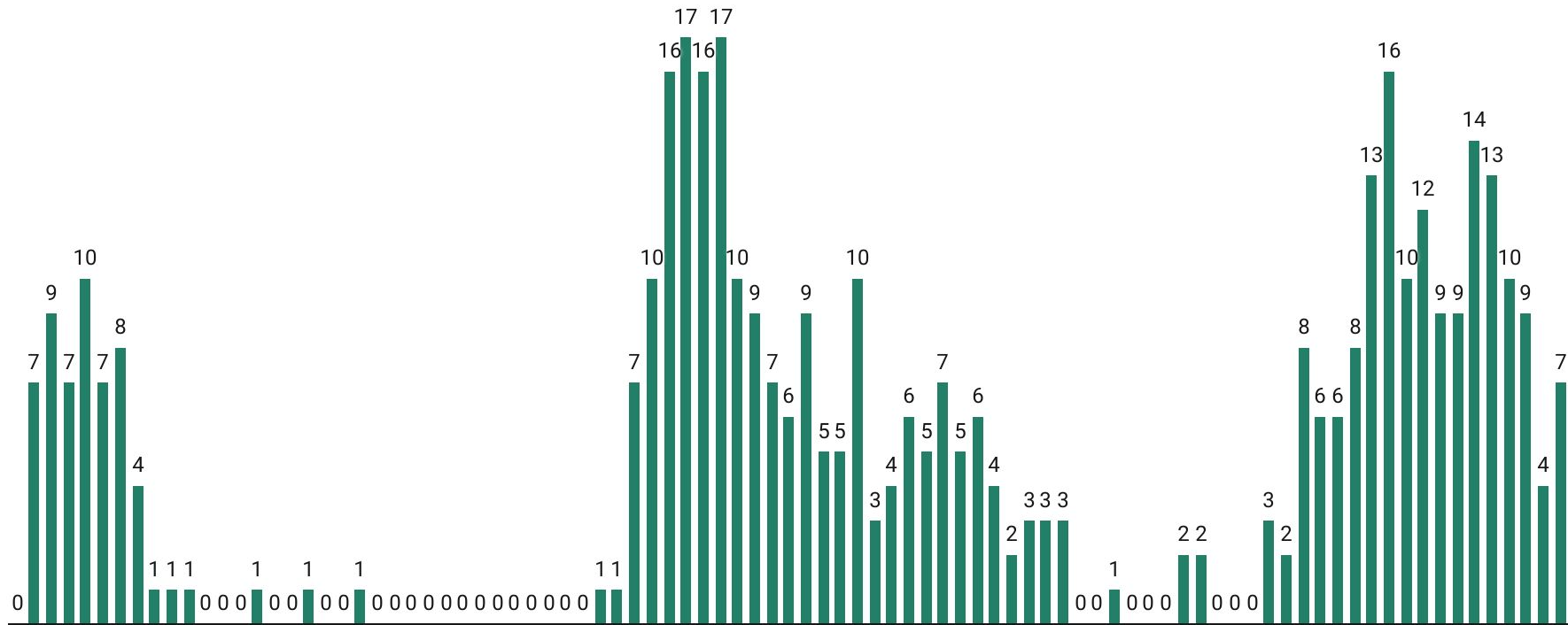
Oct

Jan  
2021

Apr

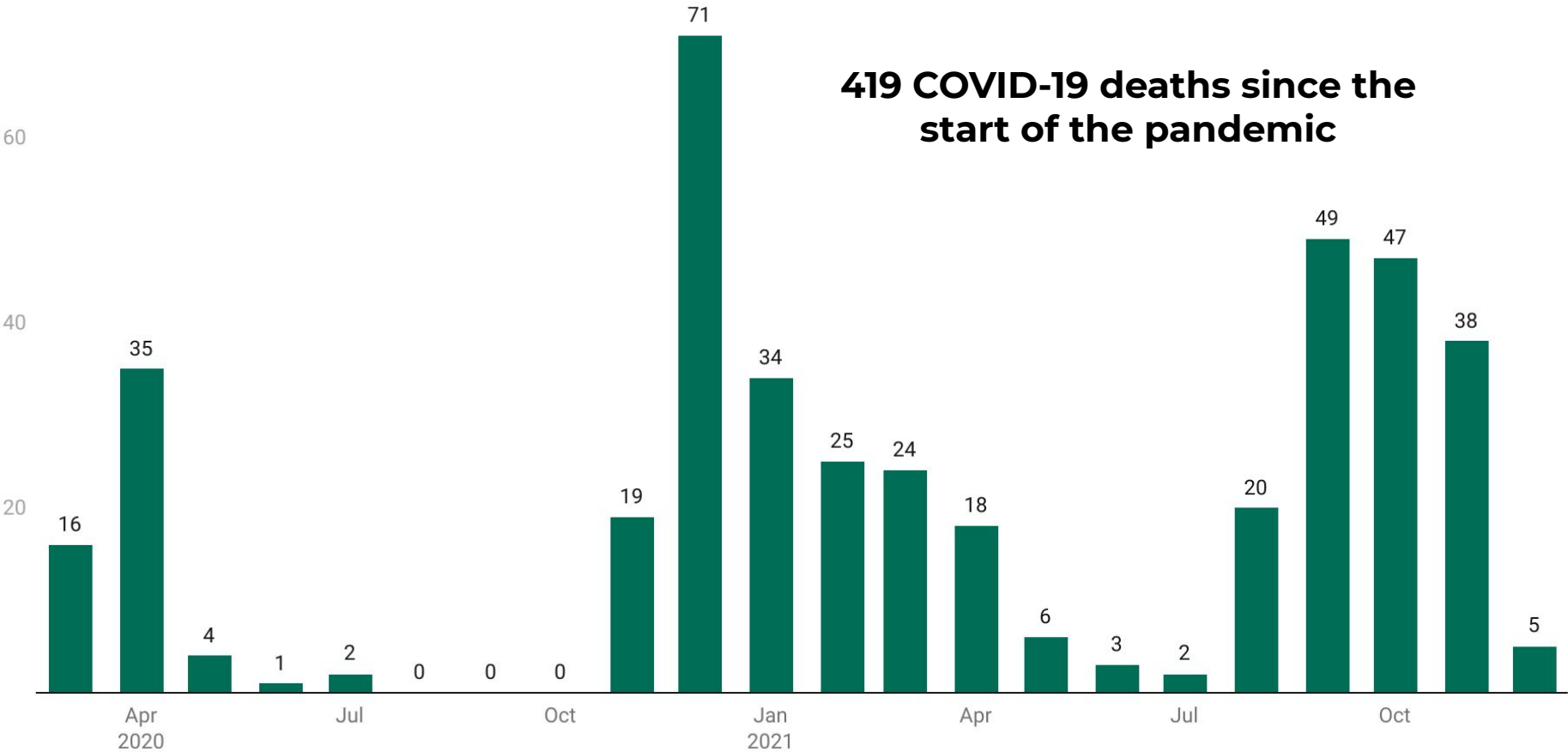
Jul

Oct



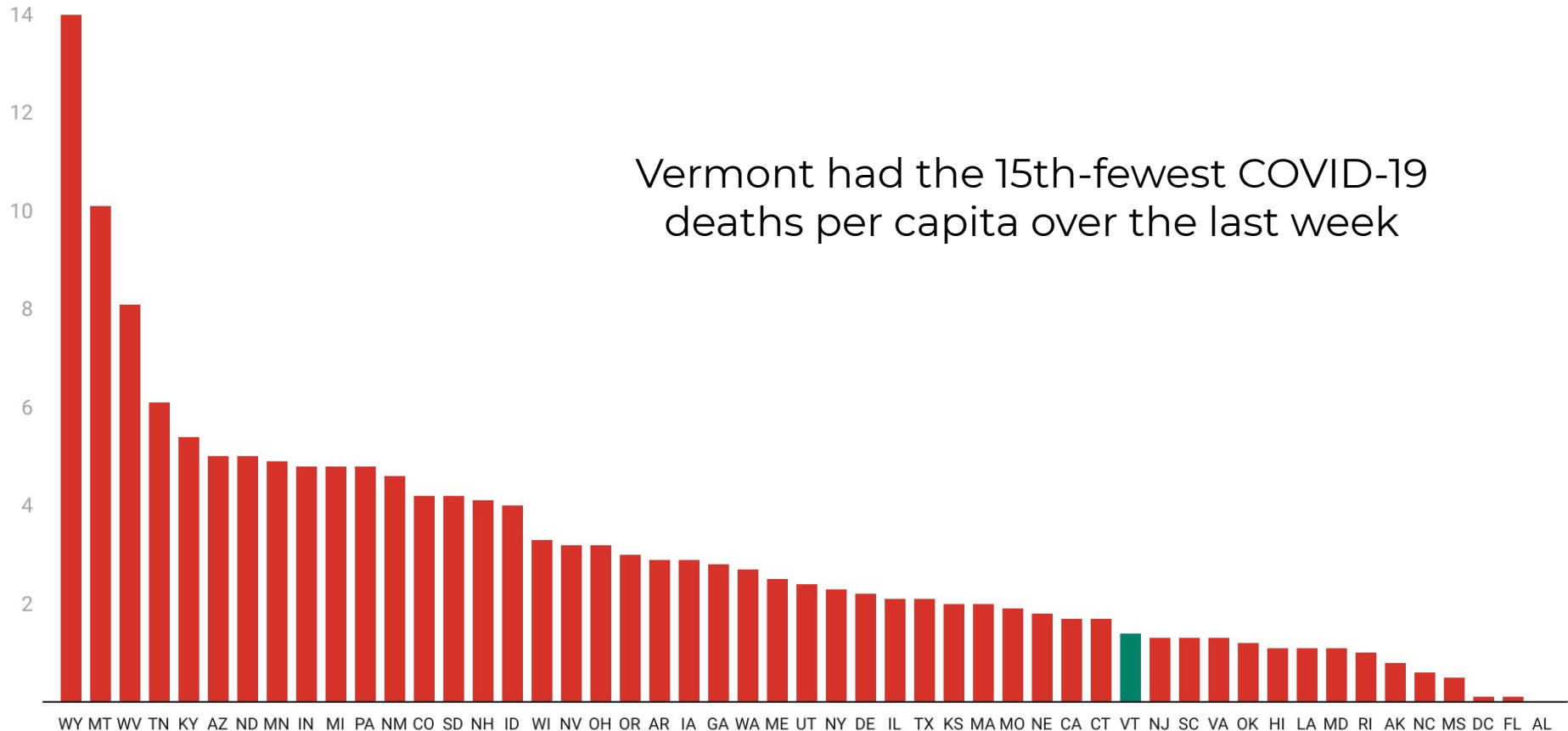
Source: Vermont Department of Health—December 7, 2021 (reporting week ending Tuesday to Monday)

# Monthly Covid-19 Deaths In Vermont



Source: Vermont Department of Health—December 7, 2021; deaths attributed to month in which death occurred rather than reported

## COVID-19 Deaths Per 100K Last 7 Days



Vermont had the 15th-fewest COVID-19 deaths per capita over the last week

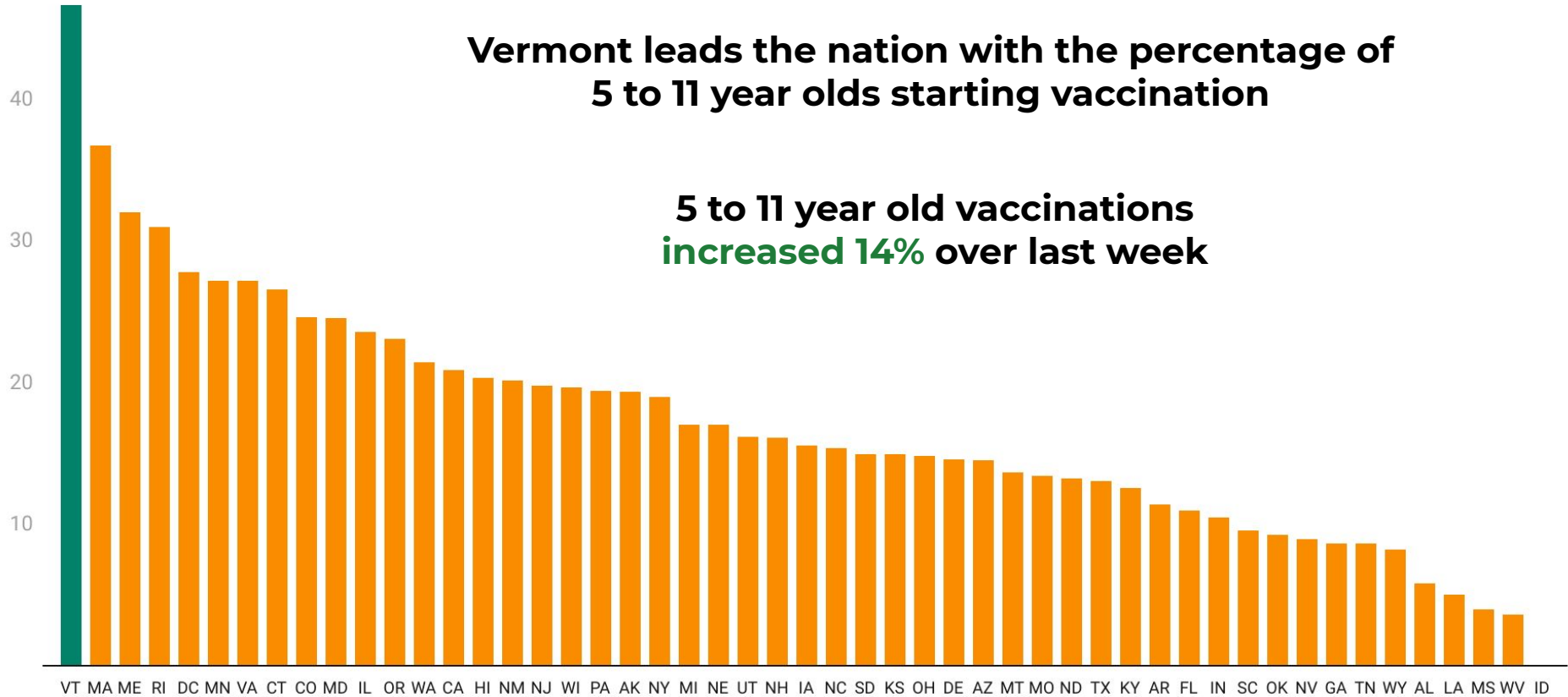
# Vermont Vaccination Data

# Vermont CDC Vaccine Scorecard

Metric	Figure	State Ranking
<b>Doses Administered per 100K</b>	<b>184,987</b>	<b>1</b>
<b>% At Least 1 Dose (5+ Population)</b>	<b>90.7%</b>	<b>2</b>
<b>% Fully Vaccinated (5+ Population)</b>	<b>77.6%</b>	<b>1</b>
<b>% At Least 1 Dose (Full Population)</b>	<b>86.5%</b>	<b>2</b>
<b>% Fully Vaccinated (Full Population)</b>	<b>74.0%</b>	<b>1</b>
<b>% Fully Vaccinated (65 &amp; Over)</b>	<b>99.2%</b>	<b>1</b>

# Percent of 5 to 11 Population Starting Vaccination

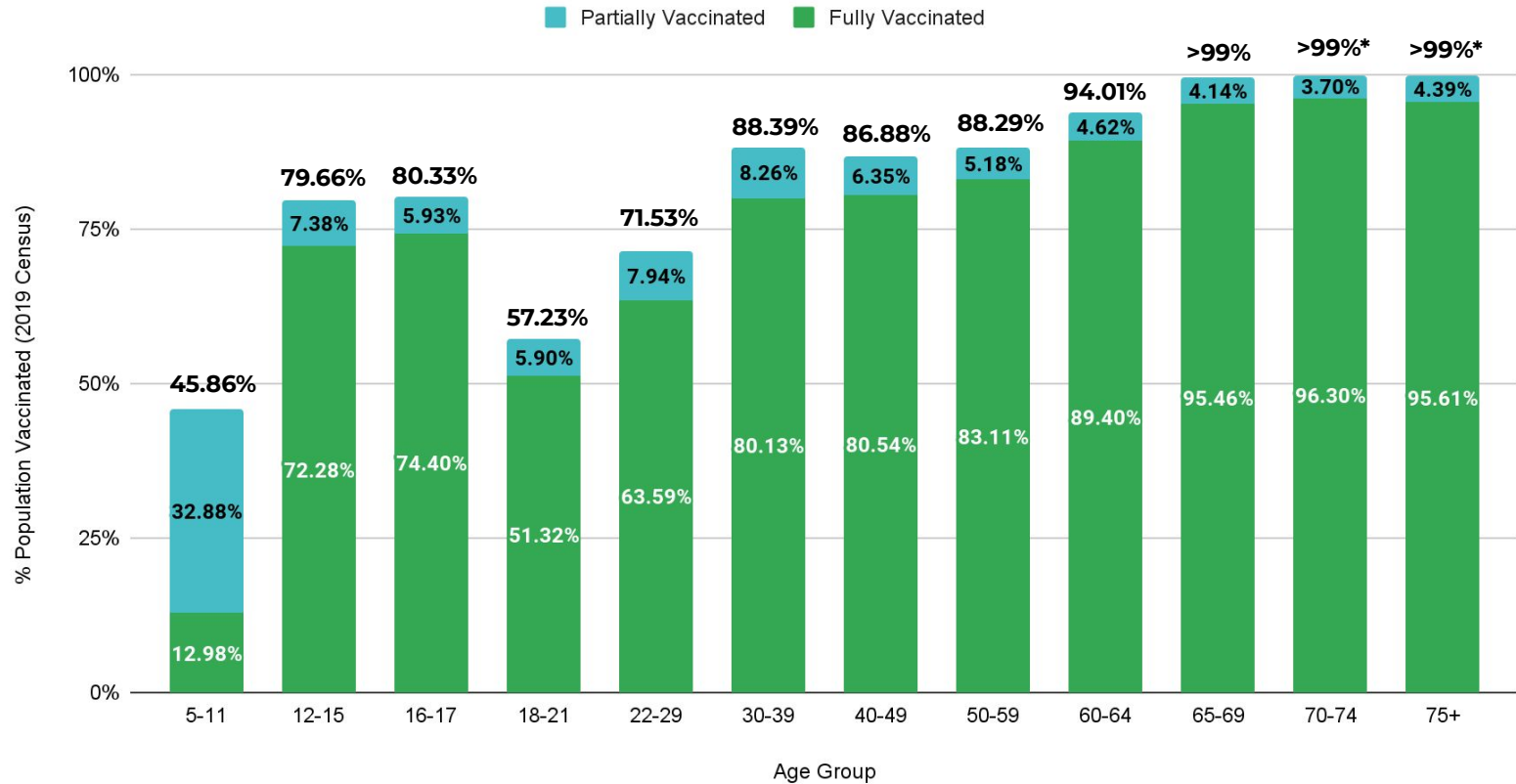
50





# Vermont Vaccination Progress

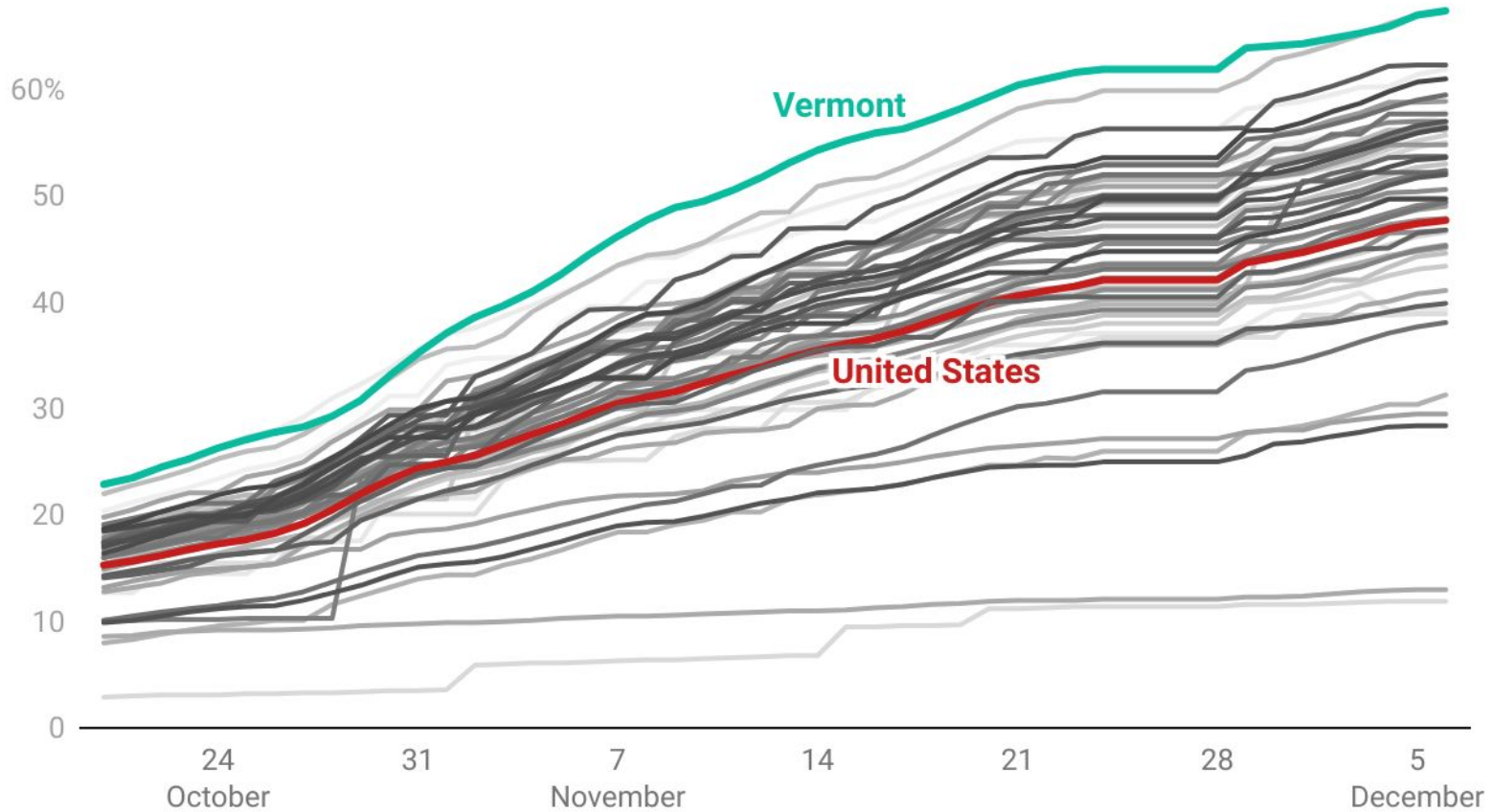
By Age Band



# Vermont CDC Booster Scorecard

Metric	Figure	State Ranking
% of Fully Vaccinated w/ booster dose	38.8%	1
% of Fully vaccinated 18+ w/ booster doses	42.0%	1
% of Fully vaccinated 50+ w/ booster doses	54.7%	1
% of Fully vaccinated 65+ w/ booster doses	67.4%	1

# Percent of Fully Vaccinated 65+ with a Booster

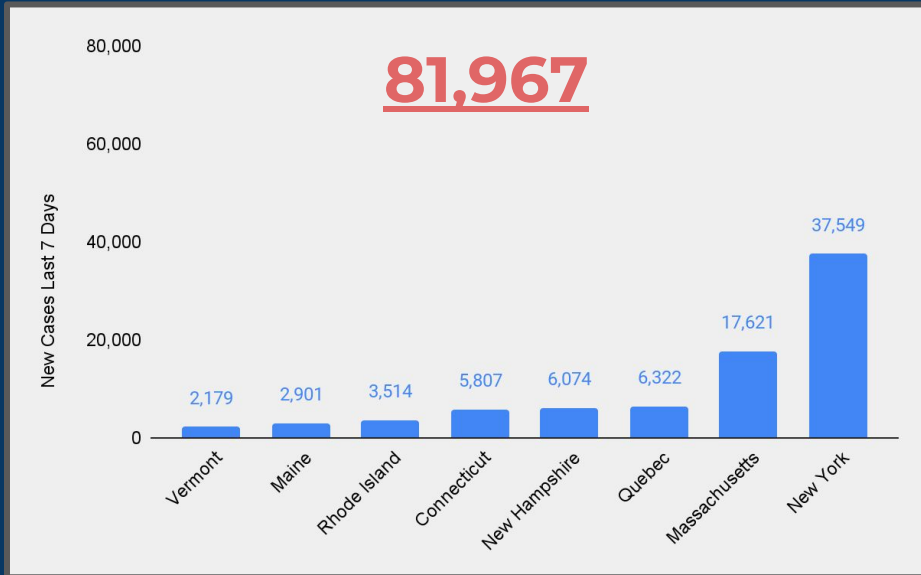


# Regional Data

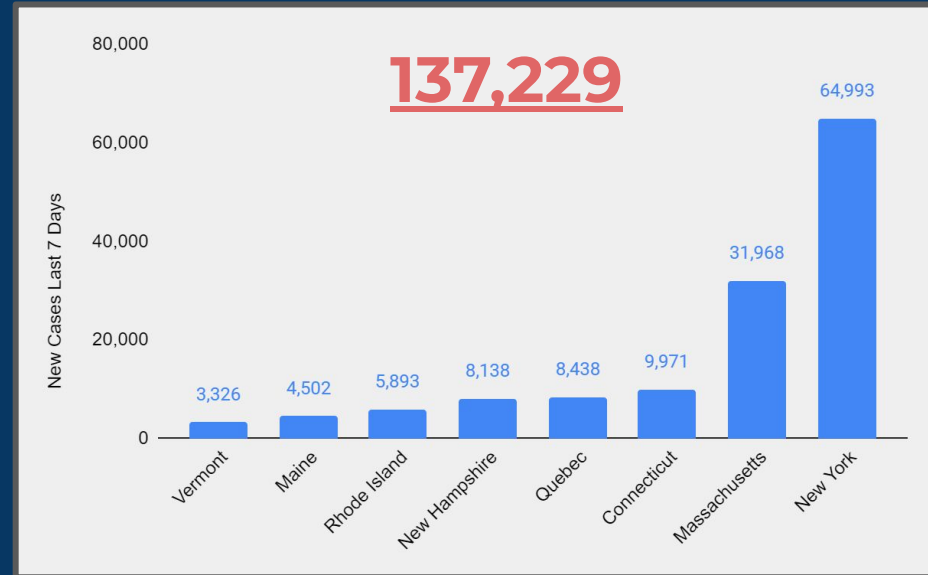
# Northeast Regional Cases

**67.4% Increase in New Cases**

New Cases November 23rd to November 29th



New Cases November 30th to December 6th



# Weekly Northeast Regional Cases

250000

200000

150000

100000

50000

0

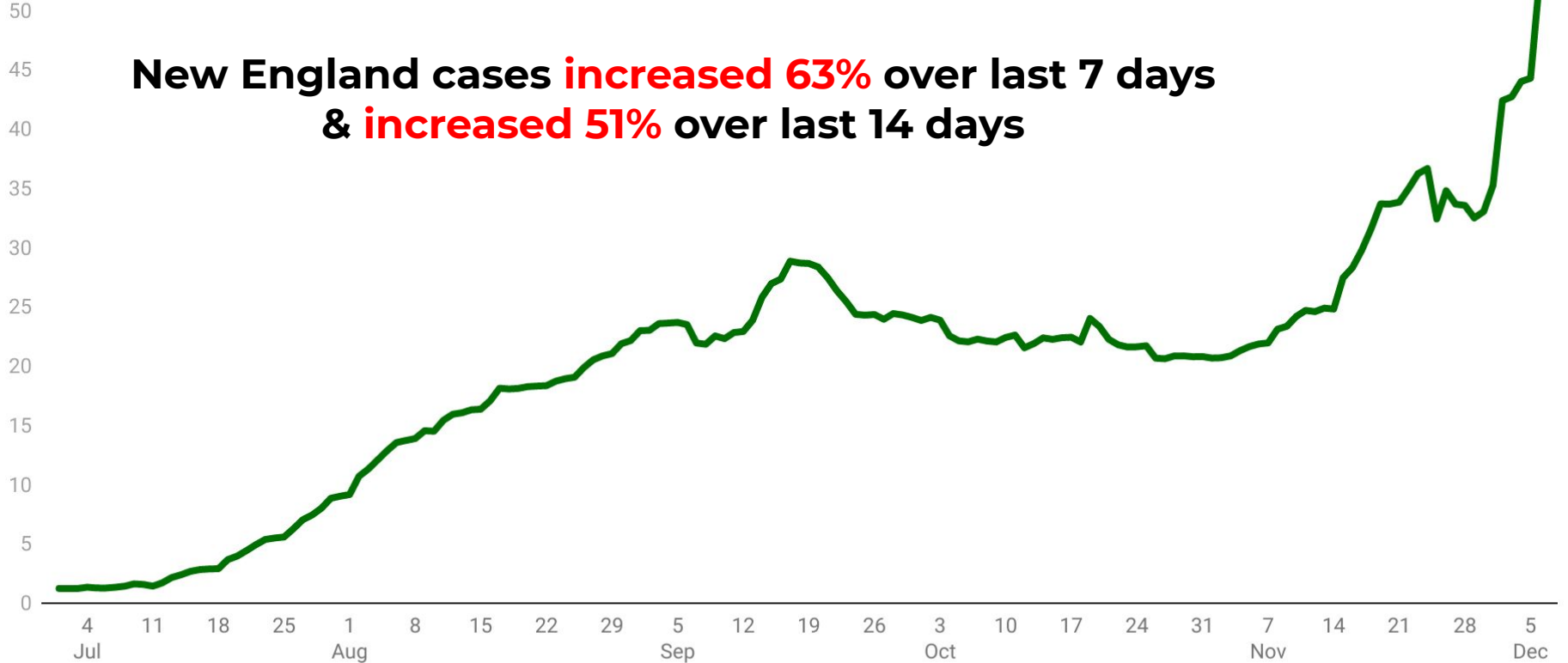
**Most Weekly COVID-19  
Cases Reported Since  
January 25, 2021**

3/16/20 4/13/20 5/11/20 6/8/20 7/6/20 8/3/20 8/31/20 9/28/20 10/26/20 11/23/20 12/21/20 1/18/21 2/15/21 3/15/21 4/12/21 5/10/21 6/7/21 7/5/21 8/2/21 8/30/21 9/27/21 10/25/21 11/22/21

Sources: State Health Depts.—November 29, 2021 (includes: CT, ME, MA, NH, NY, QC, RI & VT)

# New England COVID-19 Cases Per 100K (7-Day Average)

— New England Case Rate



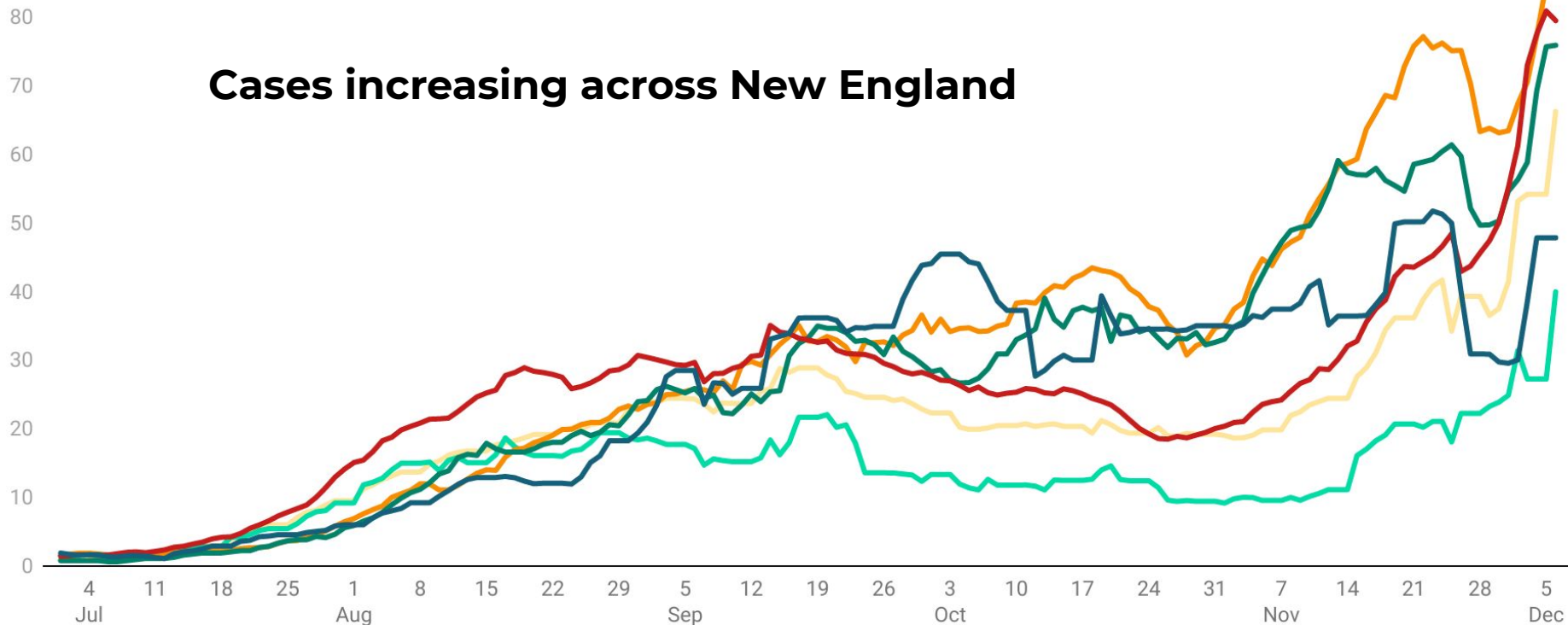
Sources: State Health Depts.—December 6, 2021 (includes: CT, ME, MA, NH, RI & VT)

# New England COVID-19 Case Trends

7-Day Average Cases Per 100K

Massachusetts Connecticut Rhode Island Maine New Hampshire Vermont

**Cases increasing across New England**

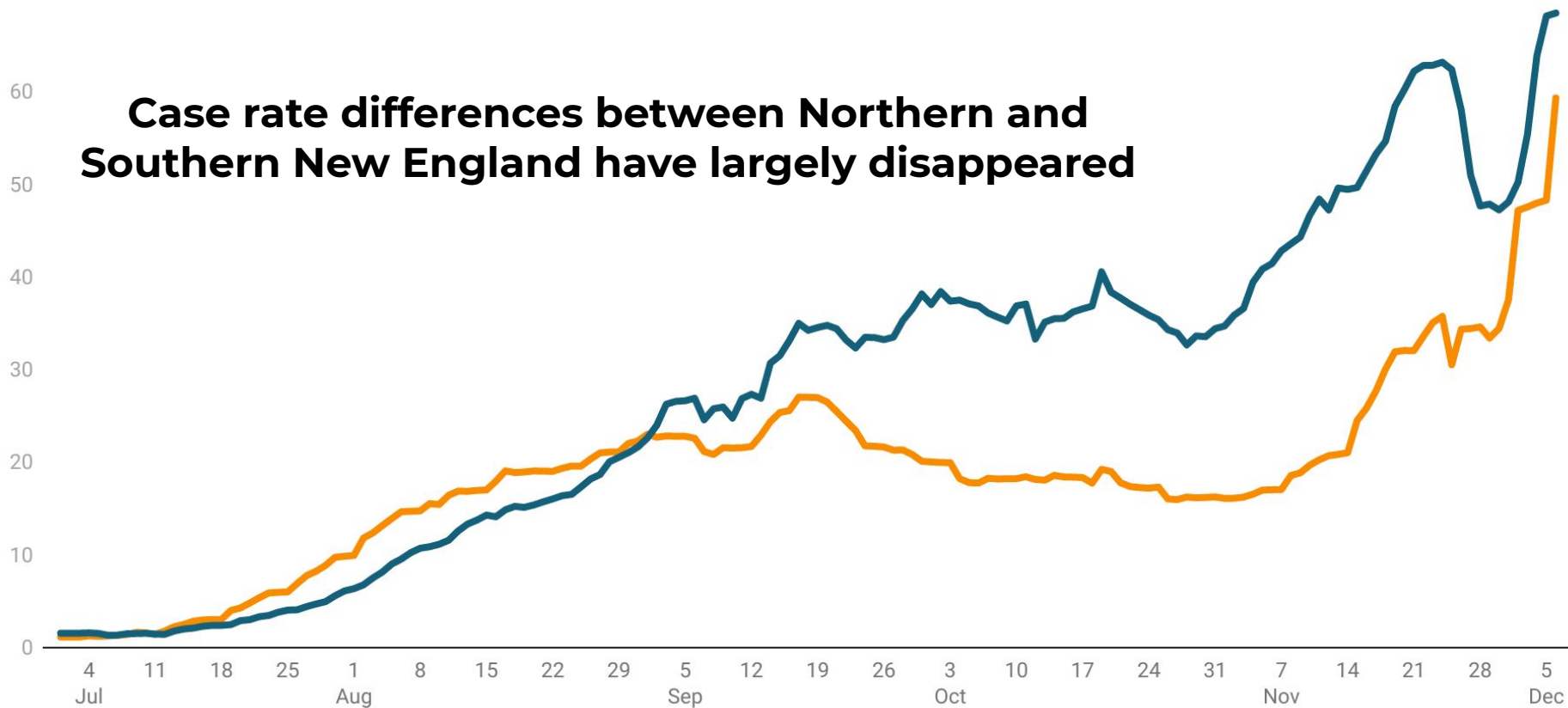


Sources: State Health Depts.—December 6, 2021 (includes: CT, ME, MA, NH, RI & VT)



# Northern vs. Southern New England Case Rate Per 100K

Southern NE 7-Day Case Rate Northern NE 7-Day Case Rate

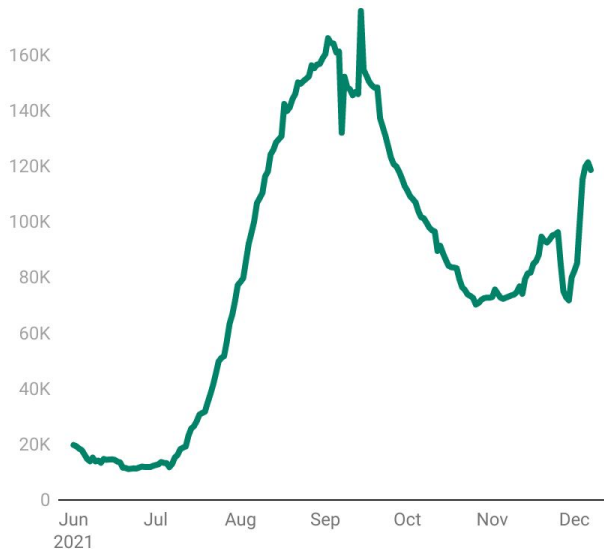


Sources: State Health Depts.—December 6, 2021 (Northern NE includes: ME, NH & VT & Southern NE includes: CT, MA & RI)

# National Data

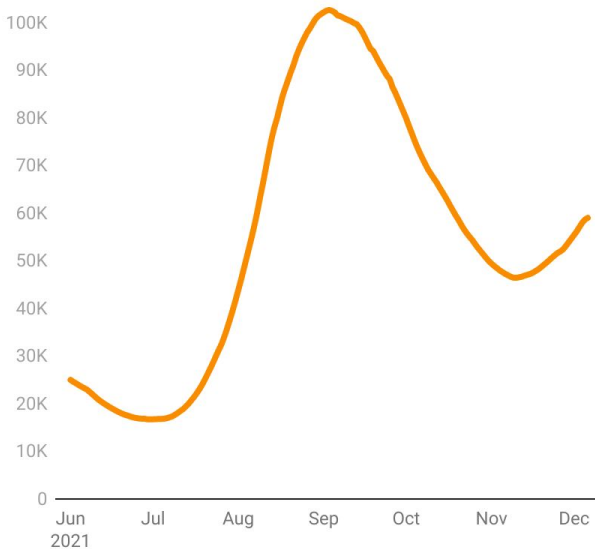
# U.S. Infections, Hospitalizations, & Deaths

**48.3% Increase**  
**Over last 7 days**



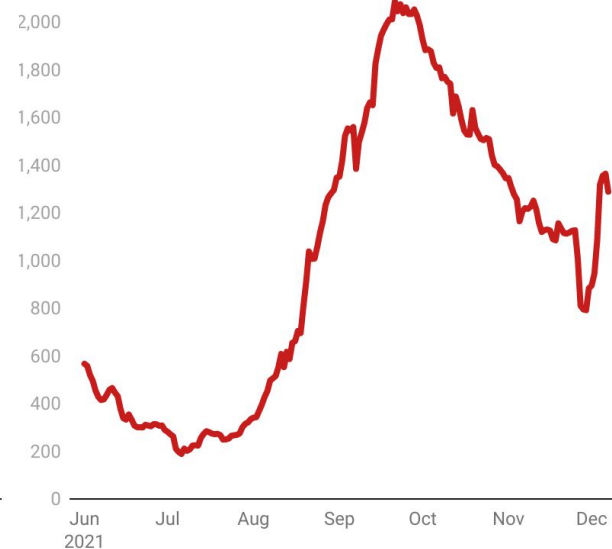
**Infections**  
**(7-Day Average)**

**8.9% Increase**  
**Over last 7 days**



**Hospitalizations**  
**(7-Day Average)**

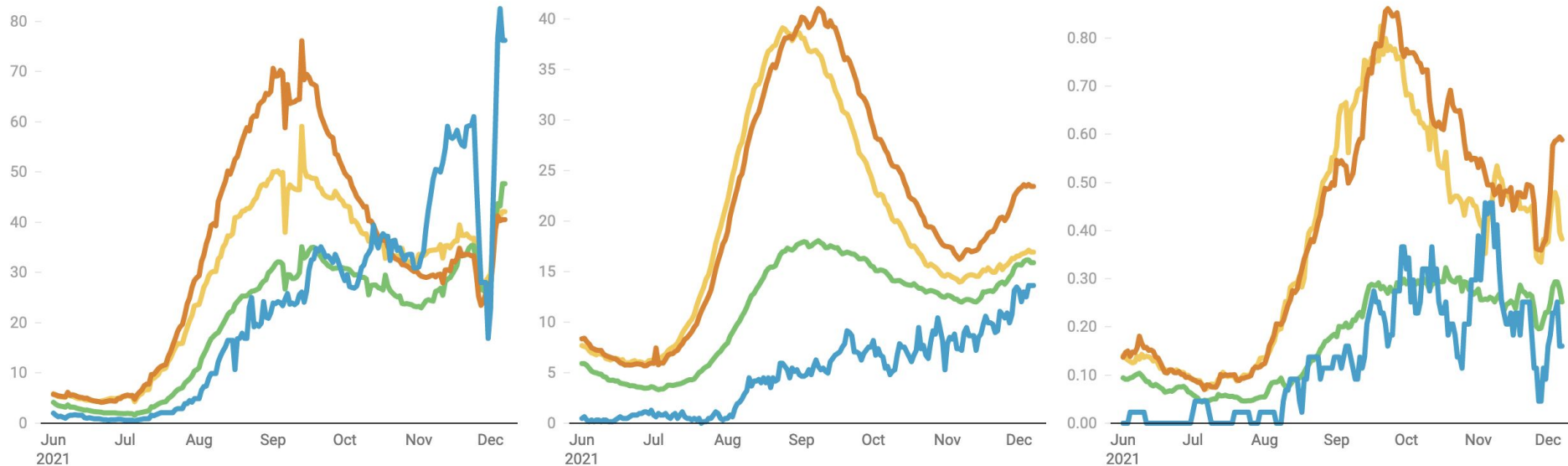
**45.8% Increase**  
**Over last 7 days**



**Deaths**  
**(7-Day Average)**

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

Bottom Third Vaccinated States    Middle Third Vaccinated States    Top Third Vaccinated States    Vermont



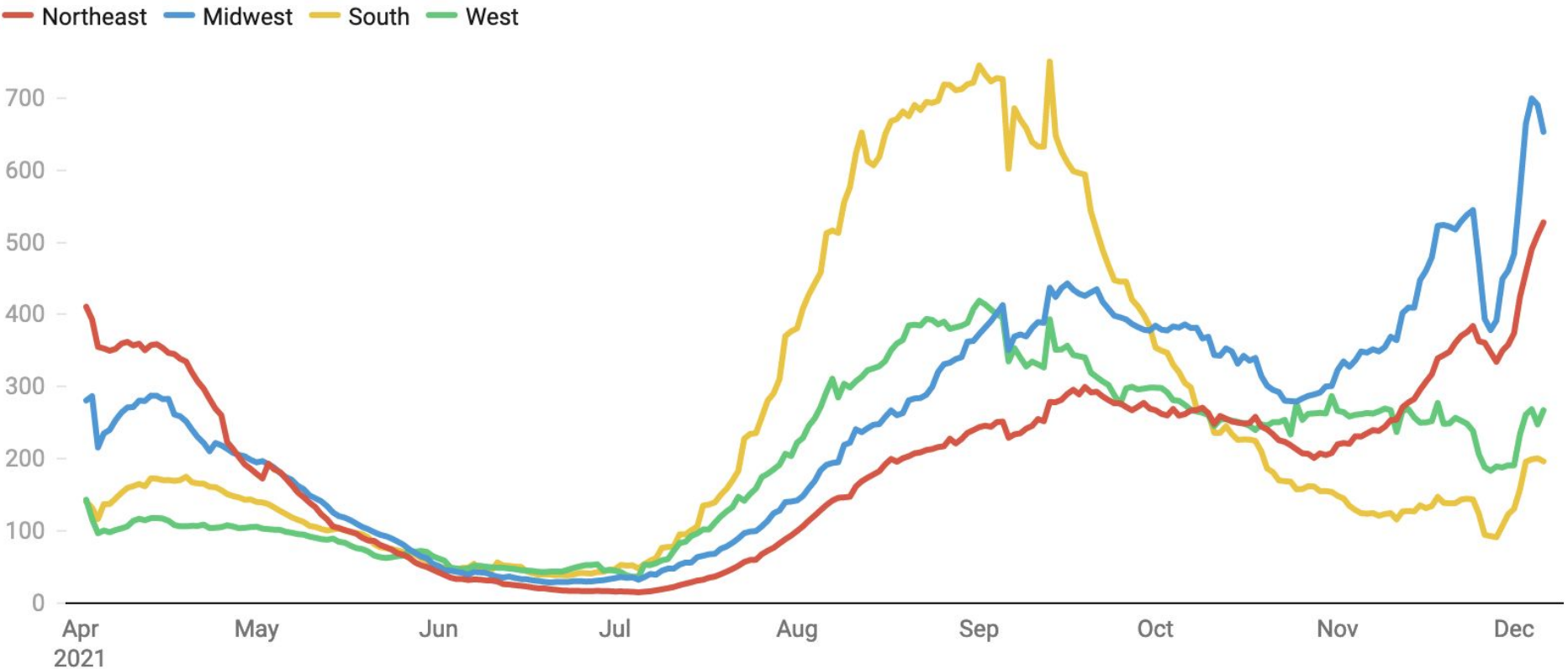
Infections per 100K

Hospitalizations per 100K  
(Current)

Deaths per 100K

# Daily COVID-19 Cases per Million in US Regions

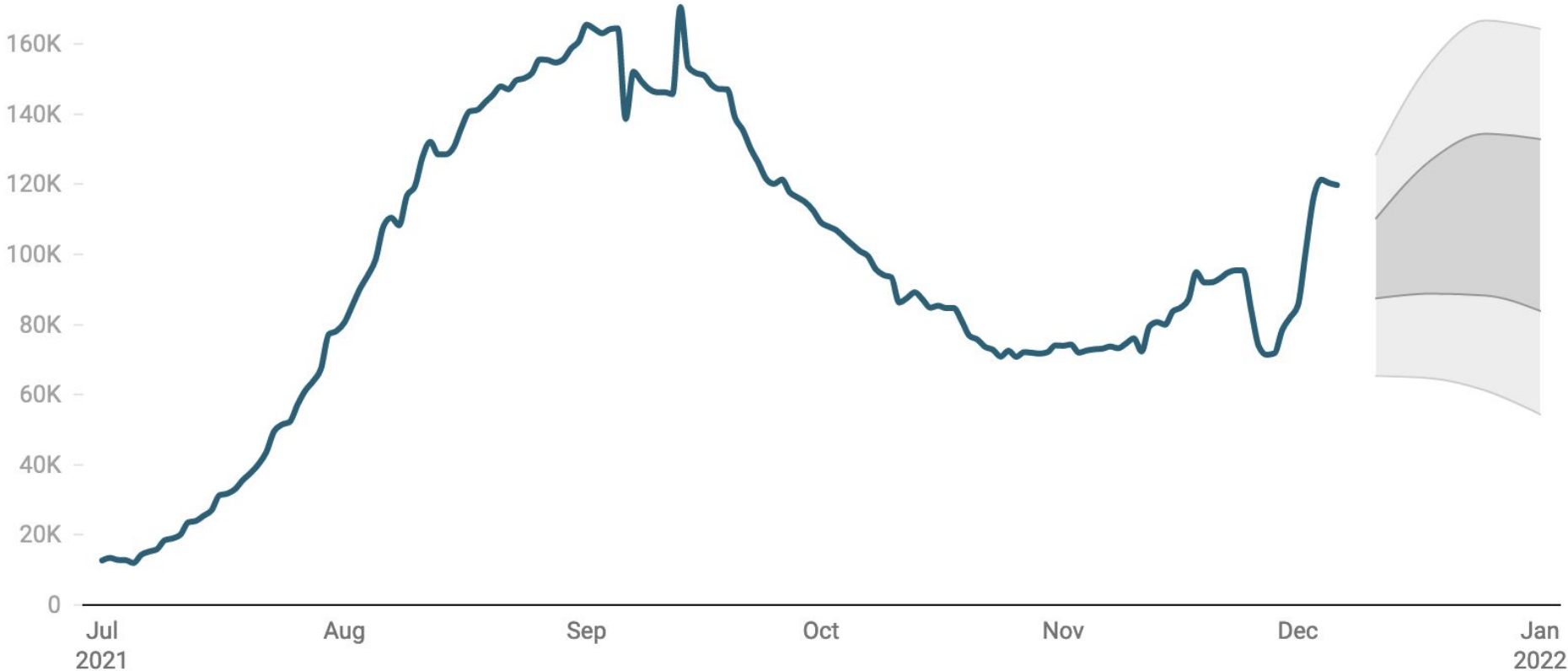
Calculated as a 7-day moving average. Definitions of North, Midwest, South, and West taken from the U.S. Census bureau.



Source: JHU—November 30, 2021; 7-day averages; created with Datawrapper

# US COVID-19 Infection Confidence Intervals

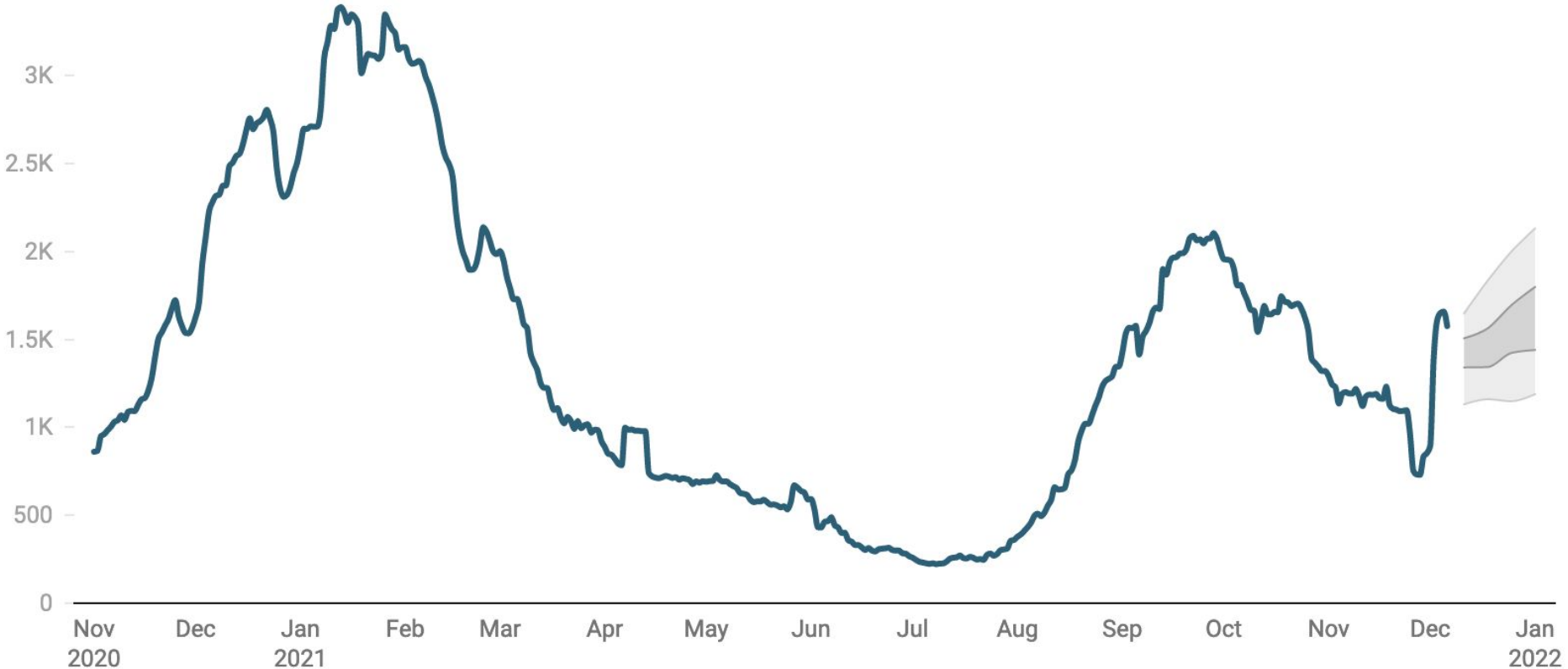
Calculated as a 7-day mean. Inner and outer bands represent 50% and 95% confidence intervals, respectively.



Source: CDC—November 30, 2021

# US COVID-19 Death Confidence Intervals

Calculated as a 7-day mean. Inner and outer bands represent 50% and 95% confidence intervals, respectively.



Source: CDC—November 30, 2021

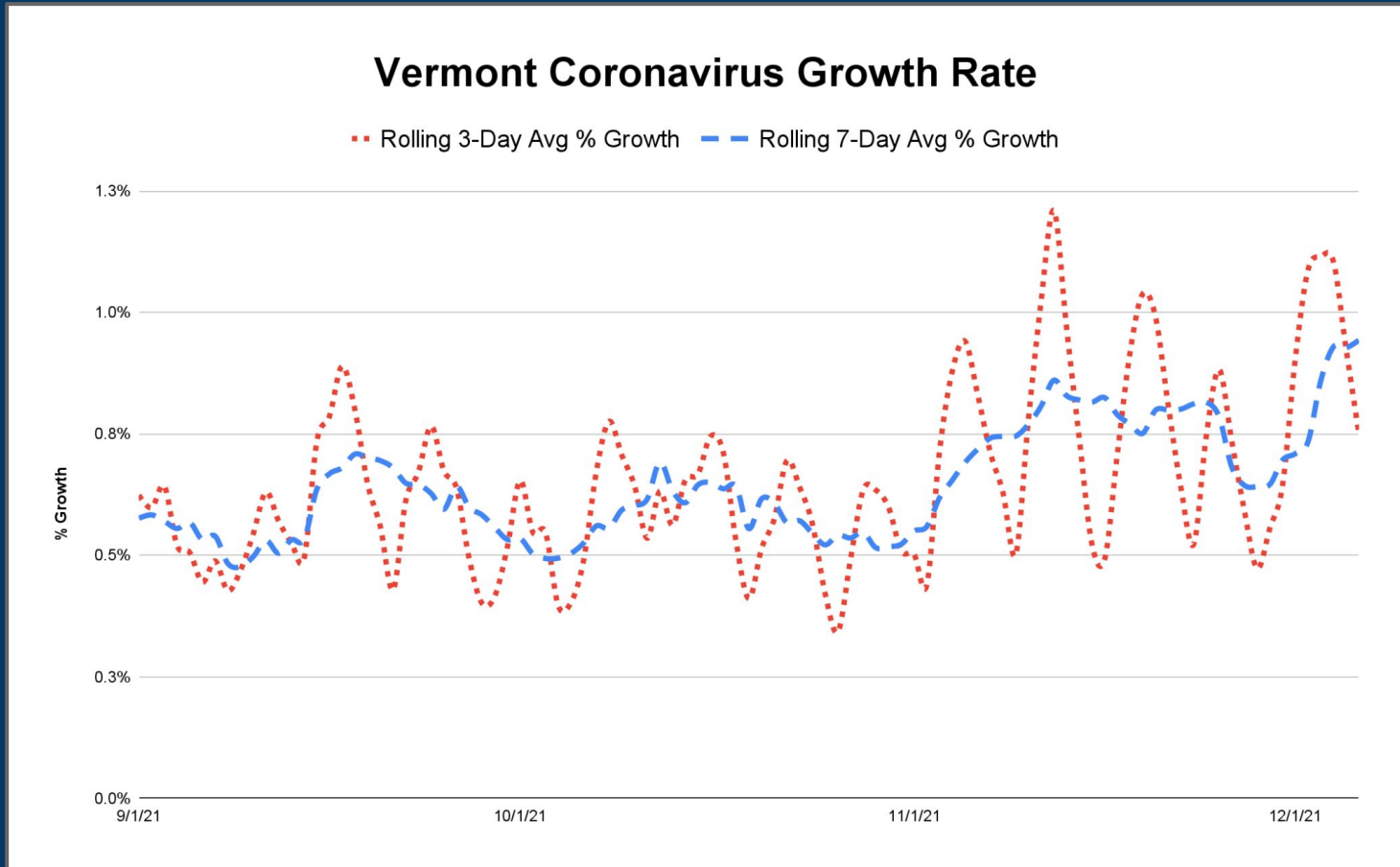
# RESTART VERMONT

## Reopening Metrics

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

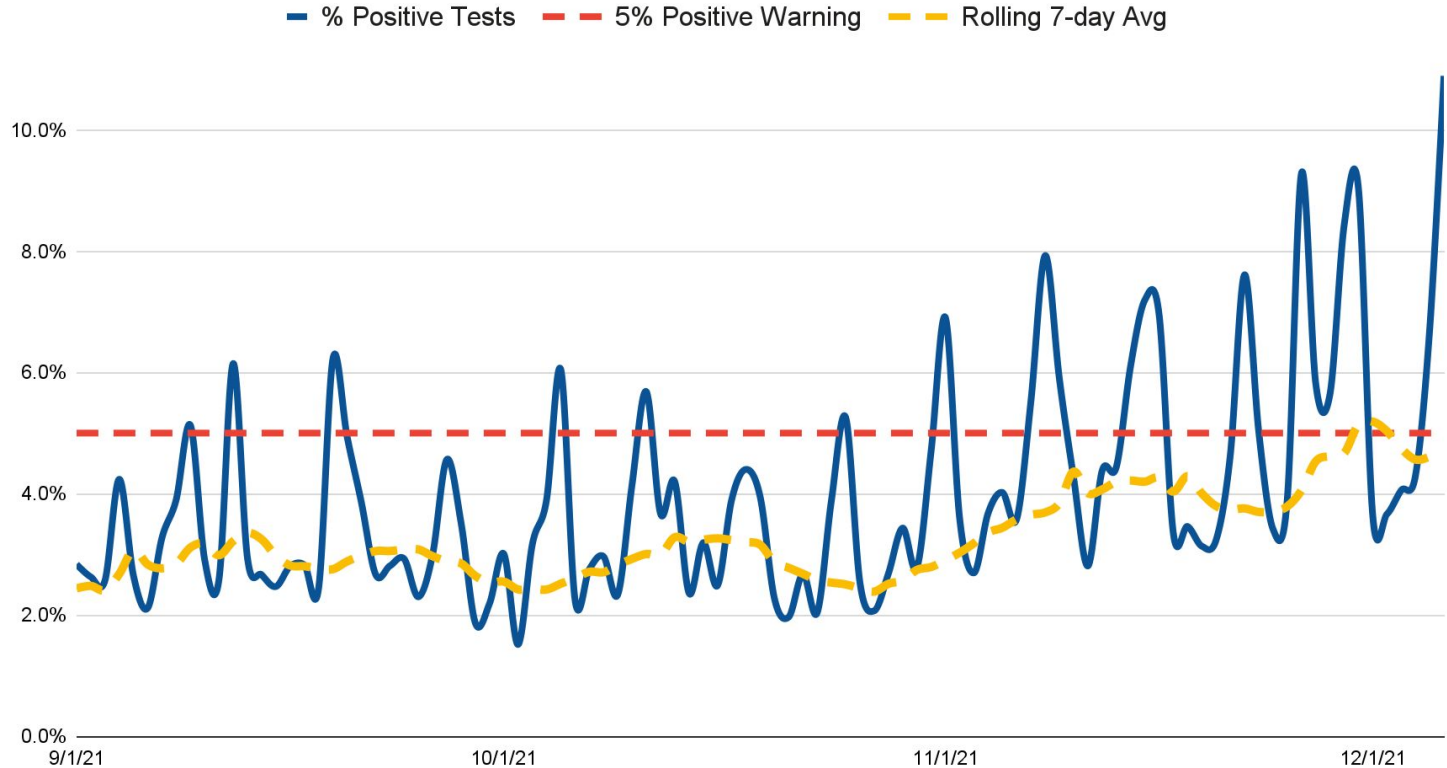


# Viral Growth & Reproductive Rates

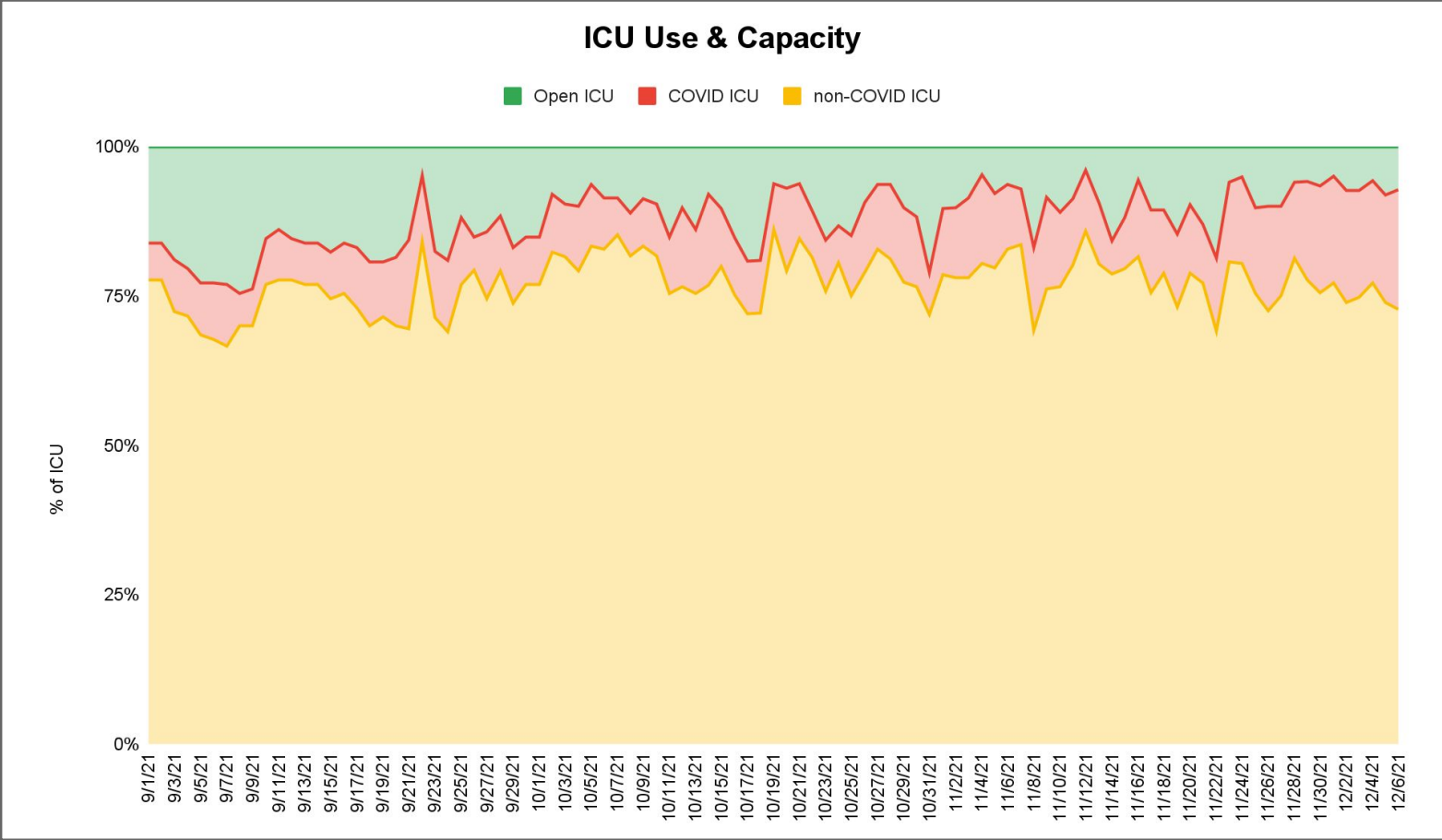


# Percentage of New Positive Tests

## Percent Tests Yielding New Positive COVID-19 Cases



# Hospital & Critical Care Beds



Source: Vermont Department of Health

# Vermont Testing

