

# **COVID-19 Modeling**

## **December 21, 2021**

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

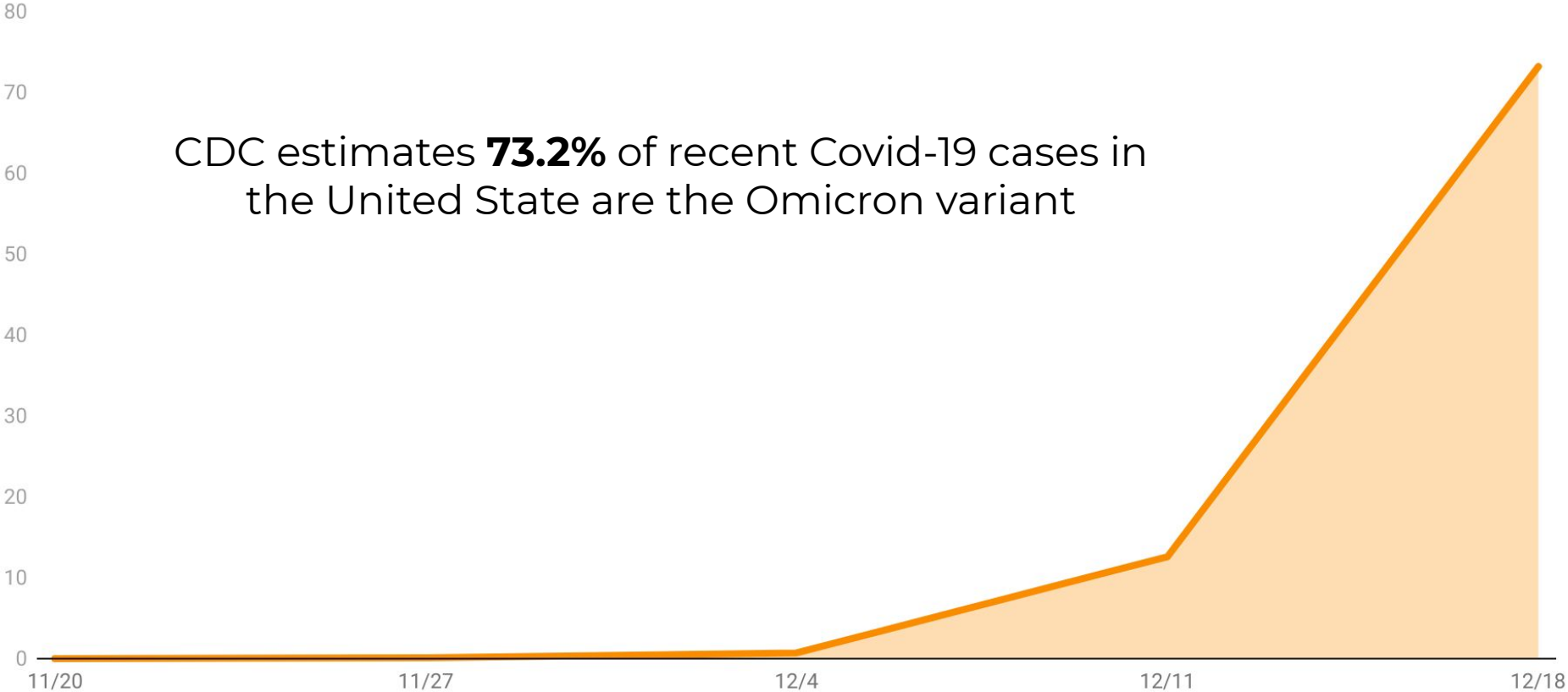
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# COVID-19 Variant Data

# Spread of Omicron Variant in the US

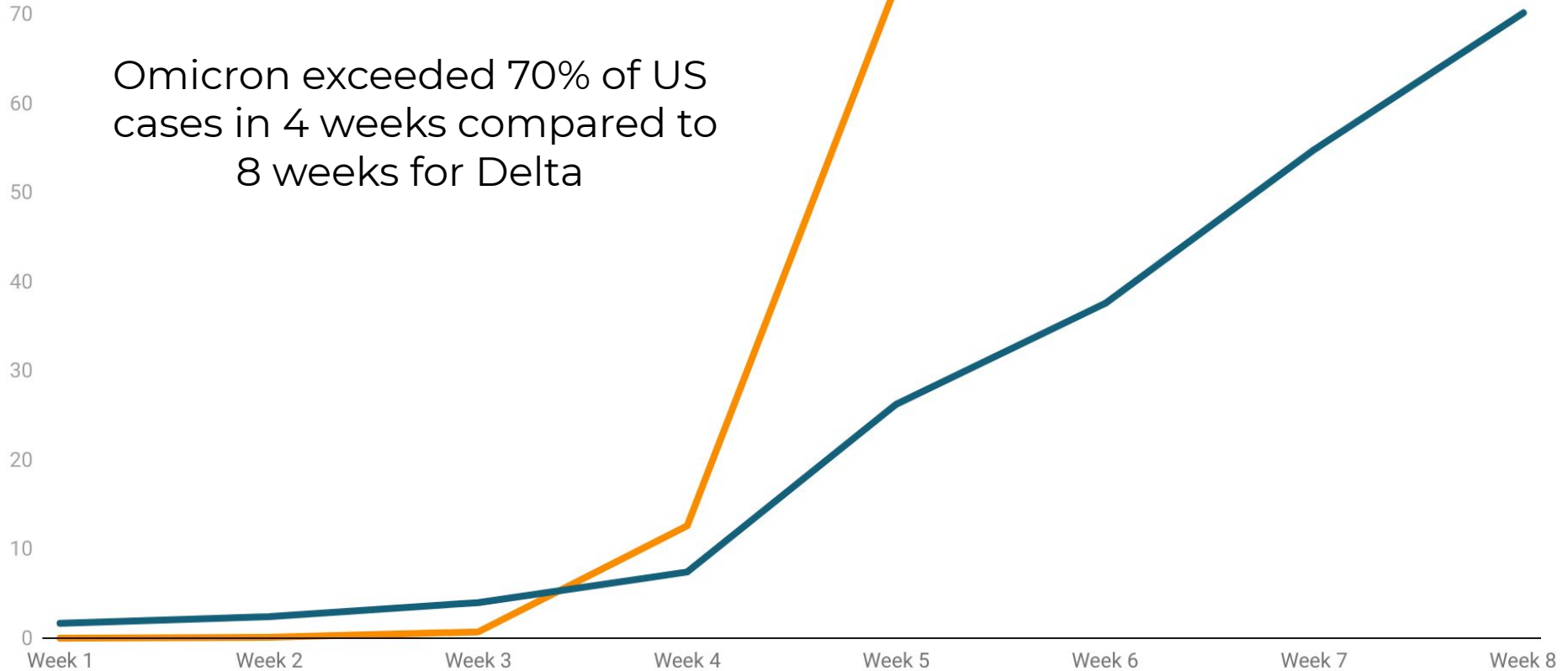
Omicron as a percentage of cases



Source: CDC—December 21, 2021; created with Datawrapper

# Spread of Variants in the U.S.

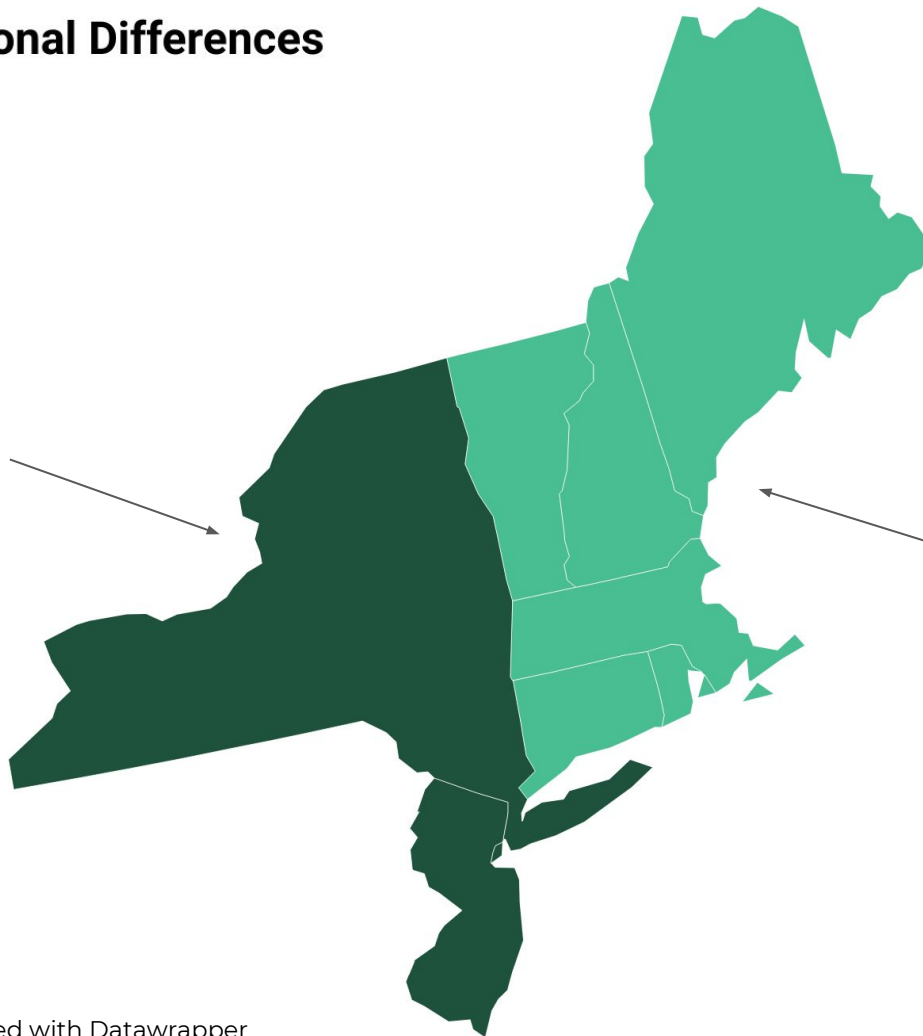
Omicron as a percentage of cases    Delta as a percentage of cases



# Omicron Spread: Regional Differences



**HHS Region 2**  
Omicron 92%  
of cases

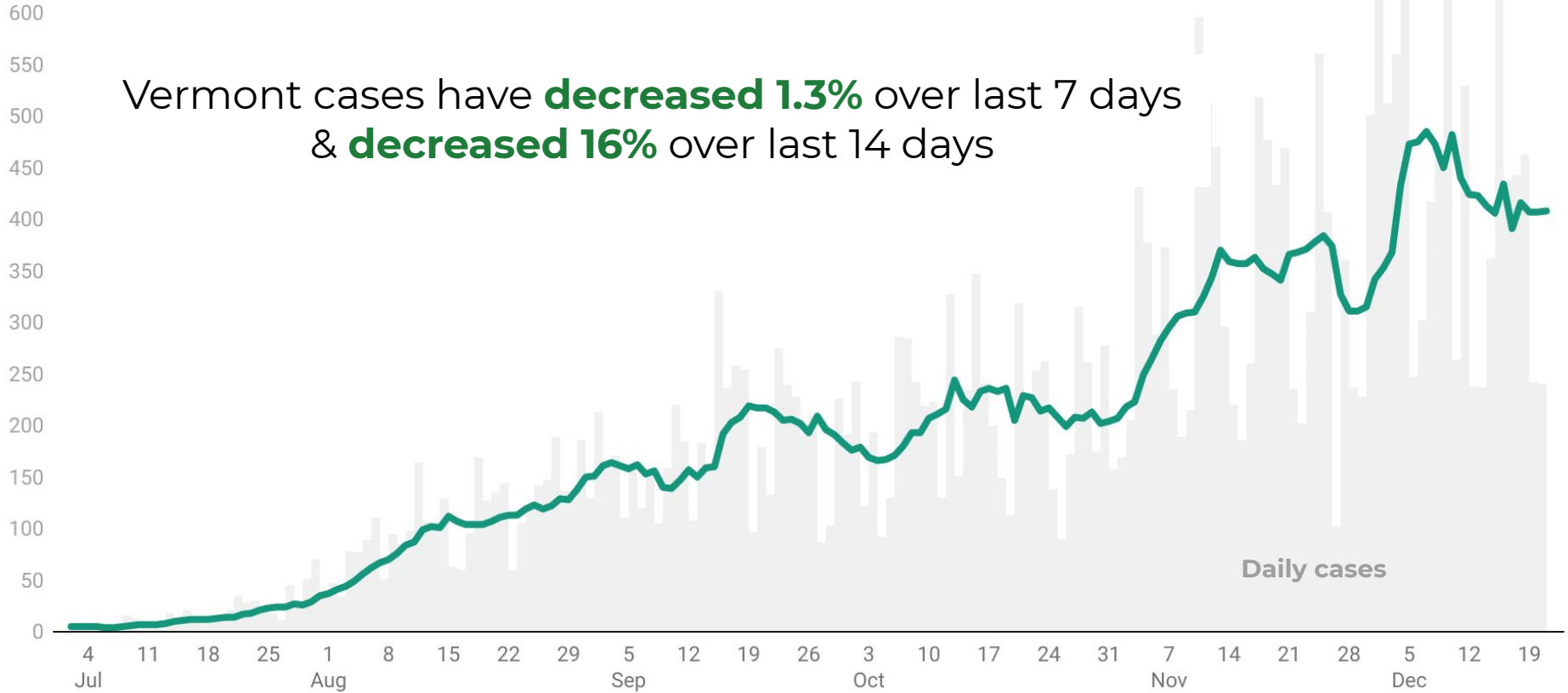


**HHS Region 1**  
Omicron 37.7%  
of cases

# Vermont Case Data

# Vermont New COVID-19 Cases

7-Day Average

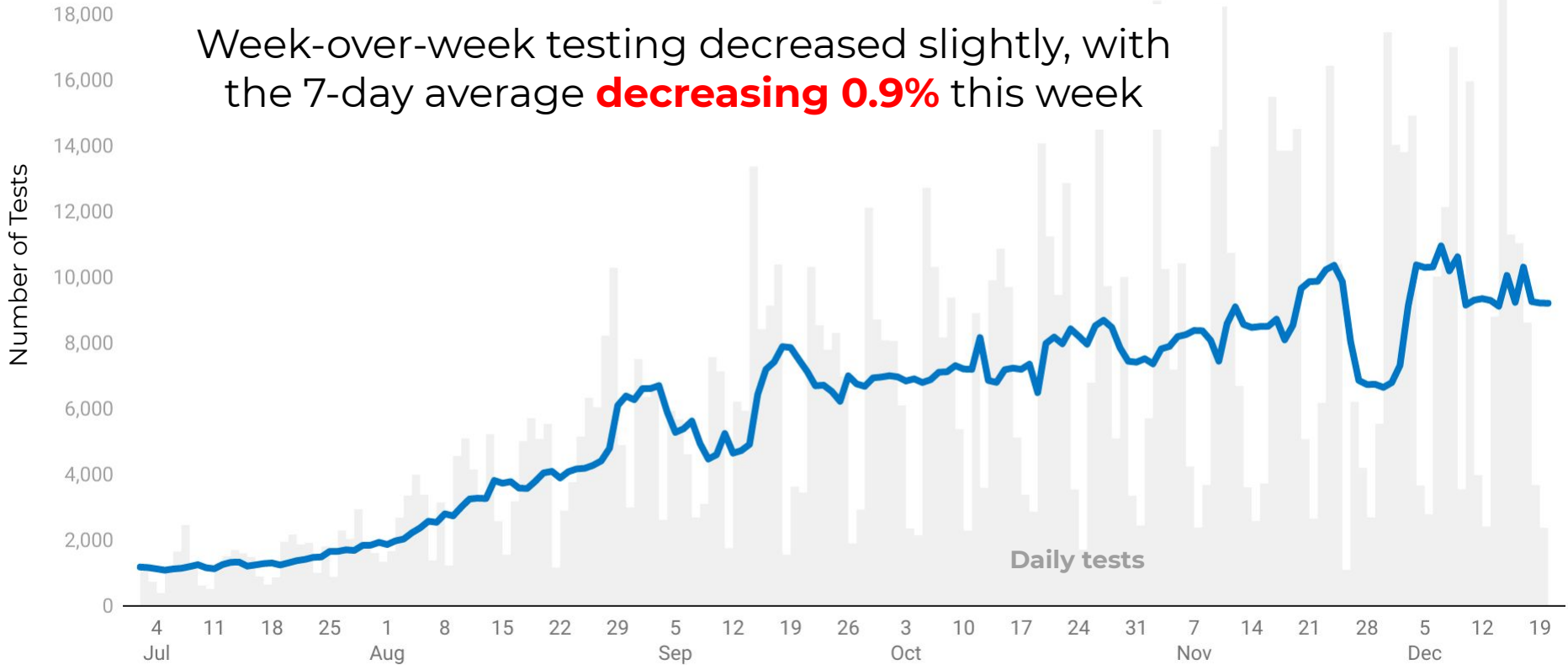




# Vermont COVID-19 Testing

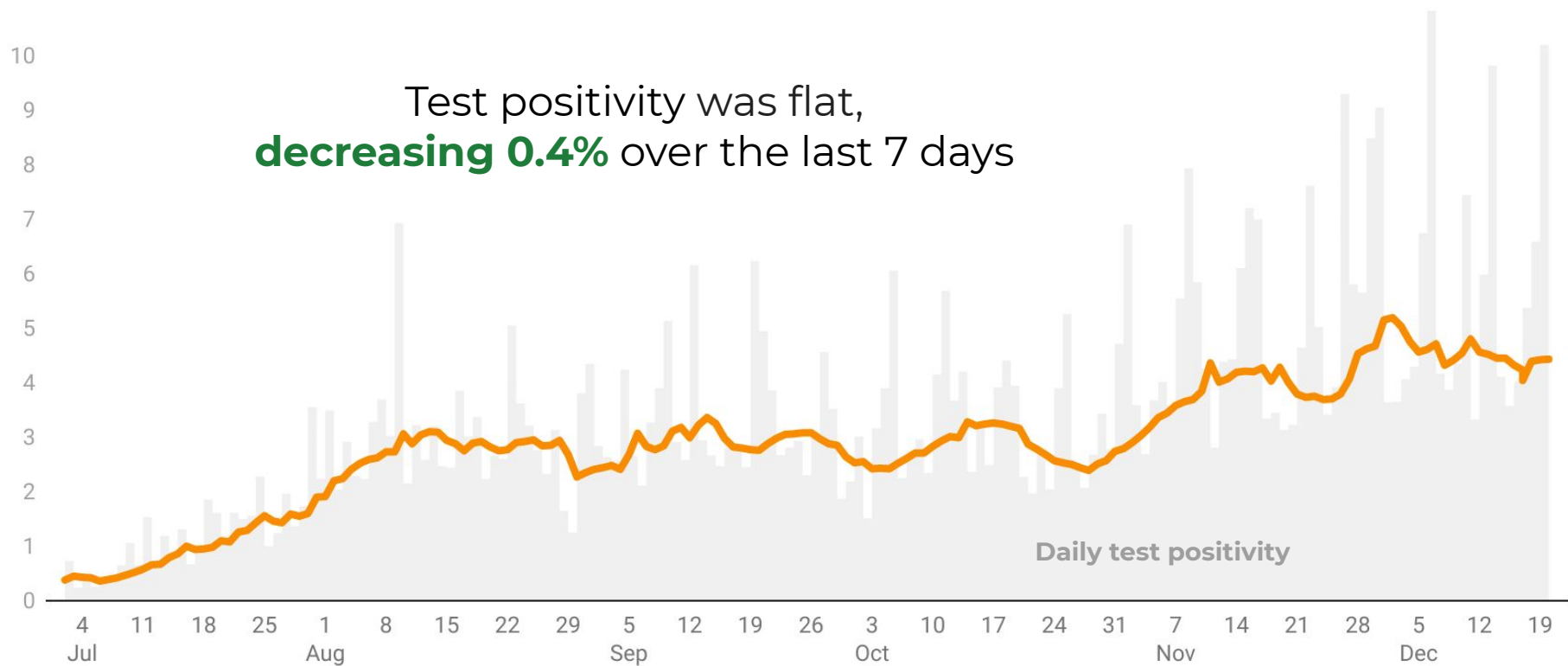
— 7-Day Average

Week-over-week testing decreased slightly, with the 7-day average **decreasing 0.9%** this week



# Vermont Test Positivity: Delta Wave

7-Day Positivity Rate



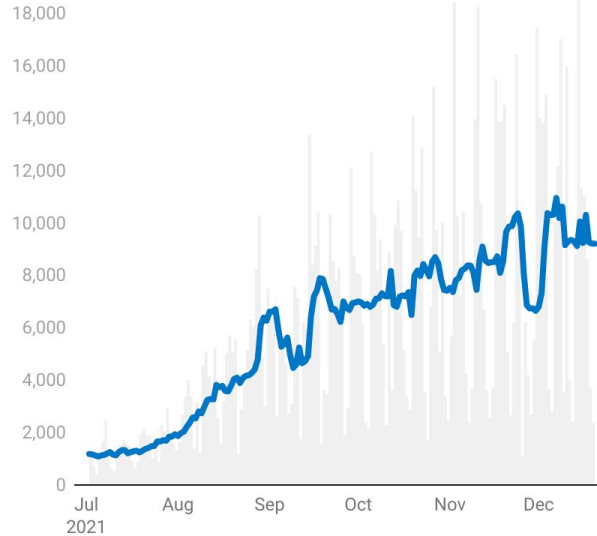
# Vermont Case Growth Metrics

**1.3% Decrease**  
**Over last 7 days**



**Infections**

**0.9% Decrease**  
**Over last 7 days**



**Testing**

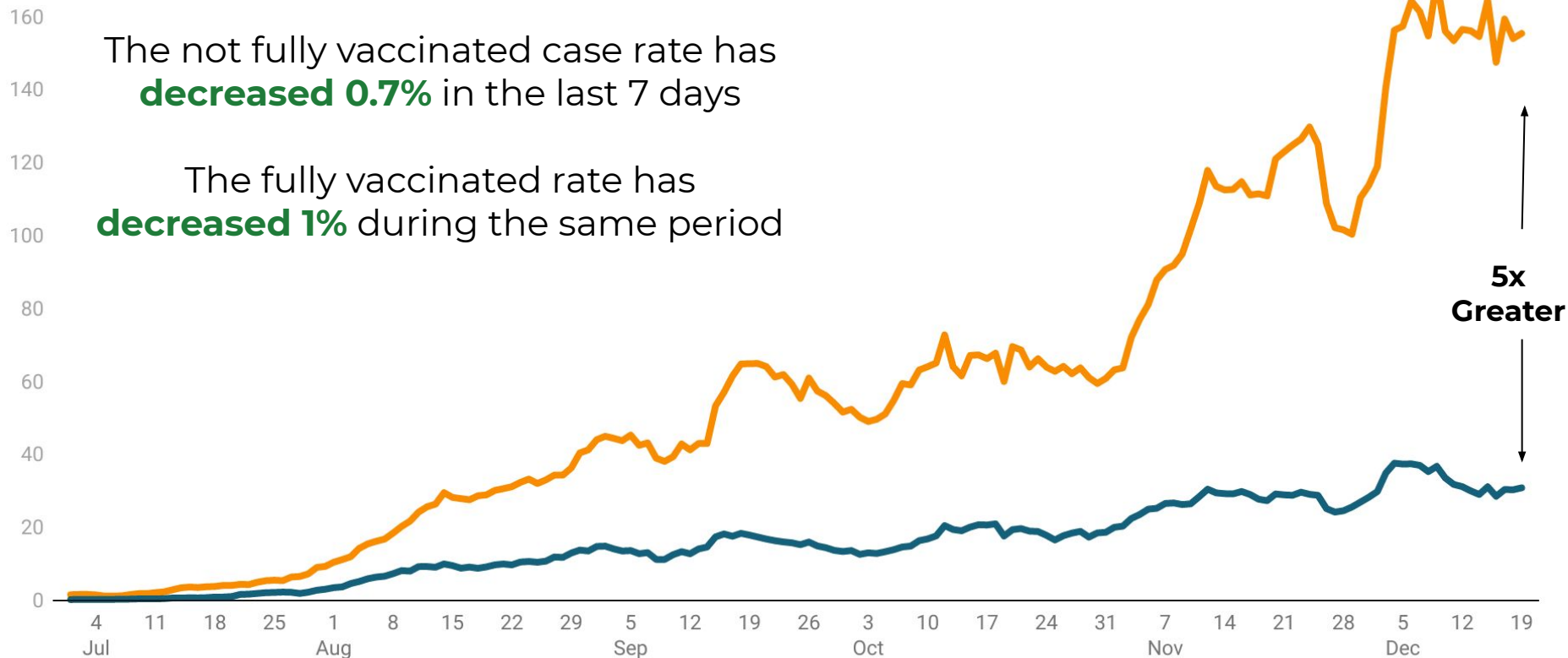
**0.4% Decrease**  
**Over last 7 days**



**Positivity Rate**

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

— Not Fully Vaccinated Case Rate — Fully Vaccinated Case Rate

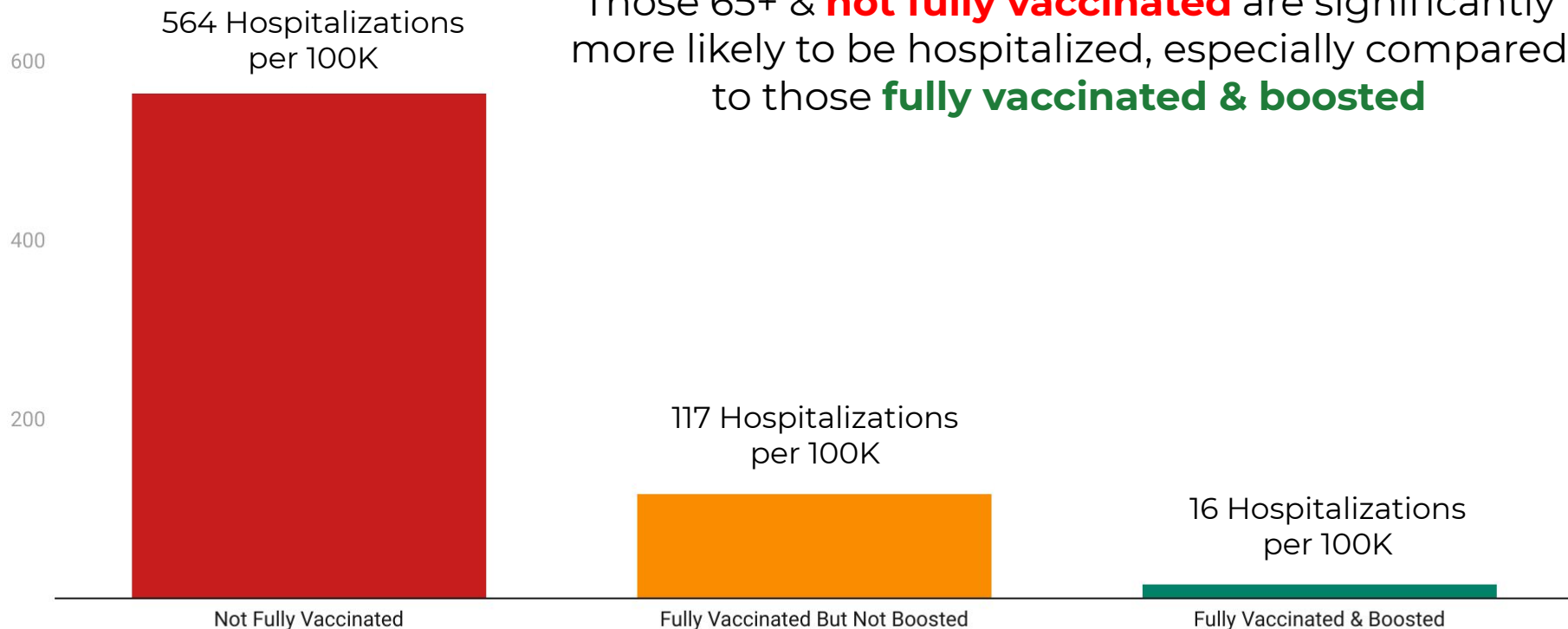


# COVID-19 Hospitalization By Vaccination Status Per 100K

Measured Among Vermont's 65 & Over Population Over the Last 6 Weeks

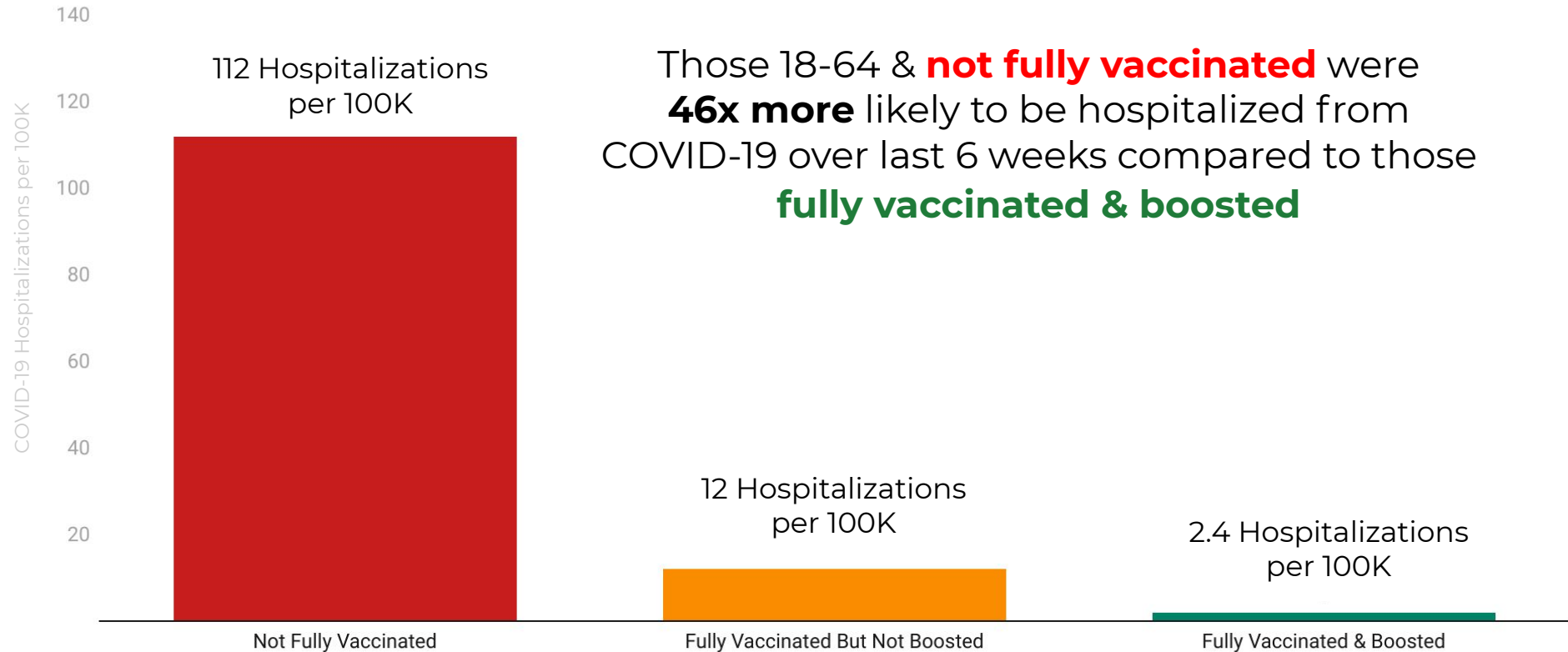
COVID-19 Hospitalizations per 100K

Those 65+ & **not fully vaccinated** are significantly more likely to be hospitalized, especially compared to those **fully vaccinated & boosted**



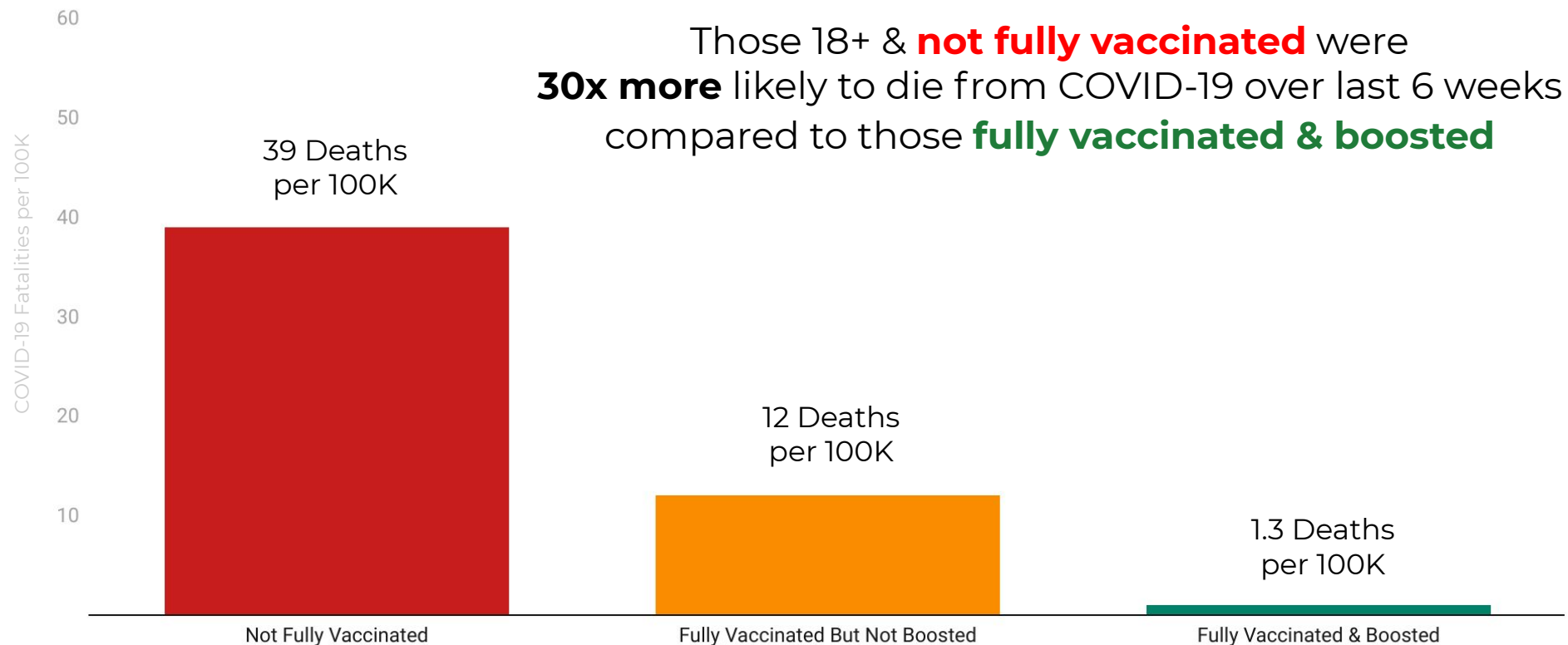
# COVID-19 Hospitalization By Vaccination Status Per 100K

Measured Among Vermont's 18 to 64 Population Over the Last 6 Weeks



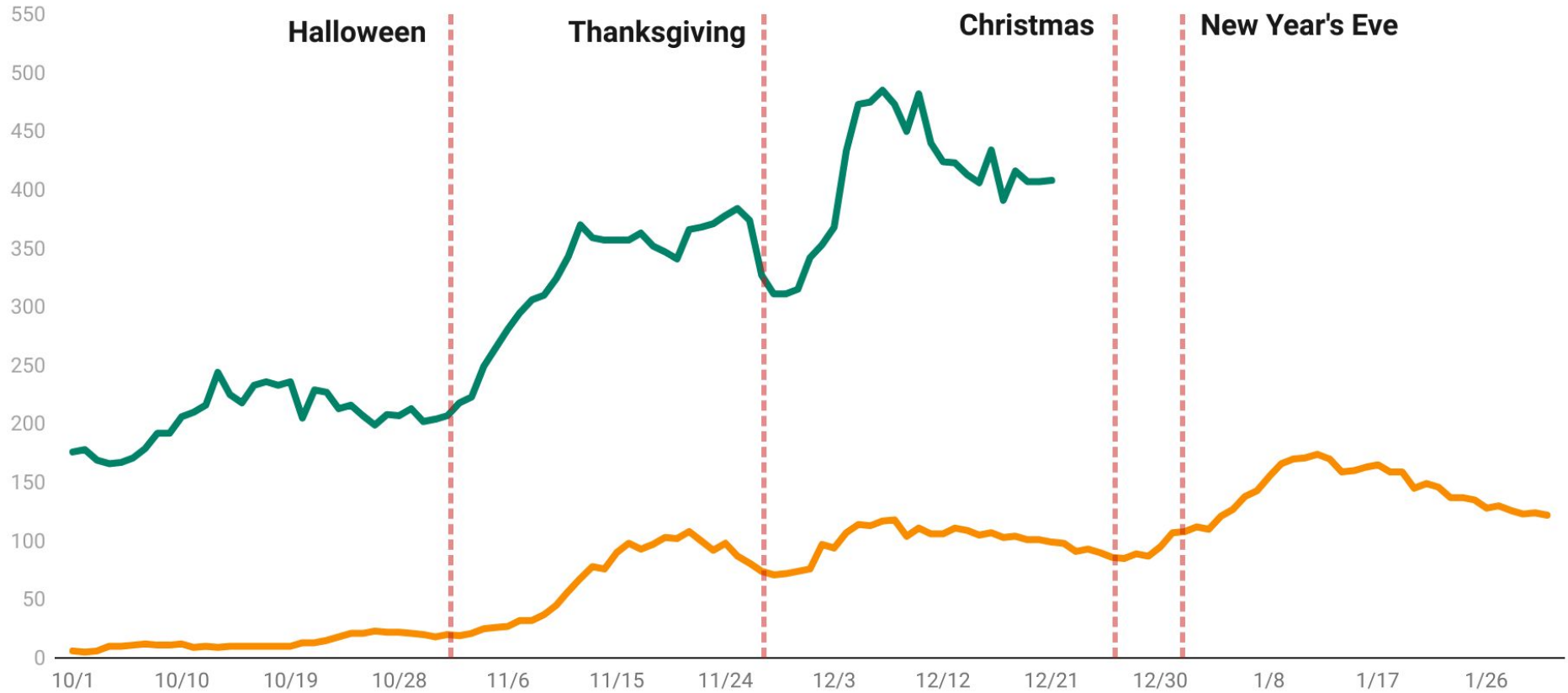
# COVID-19 Deaths By Vaccination Status Per 100K

Measured Among Vermont's 18 & Over Population Over the Last 6 Weeks



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

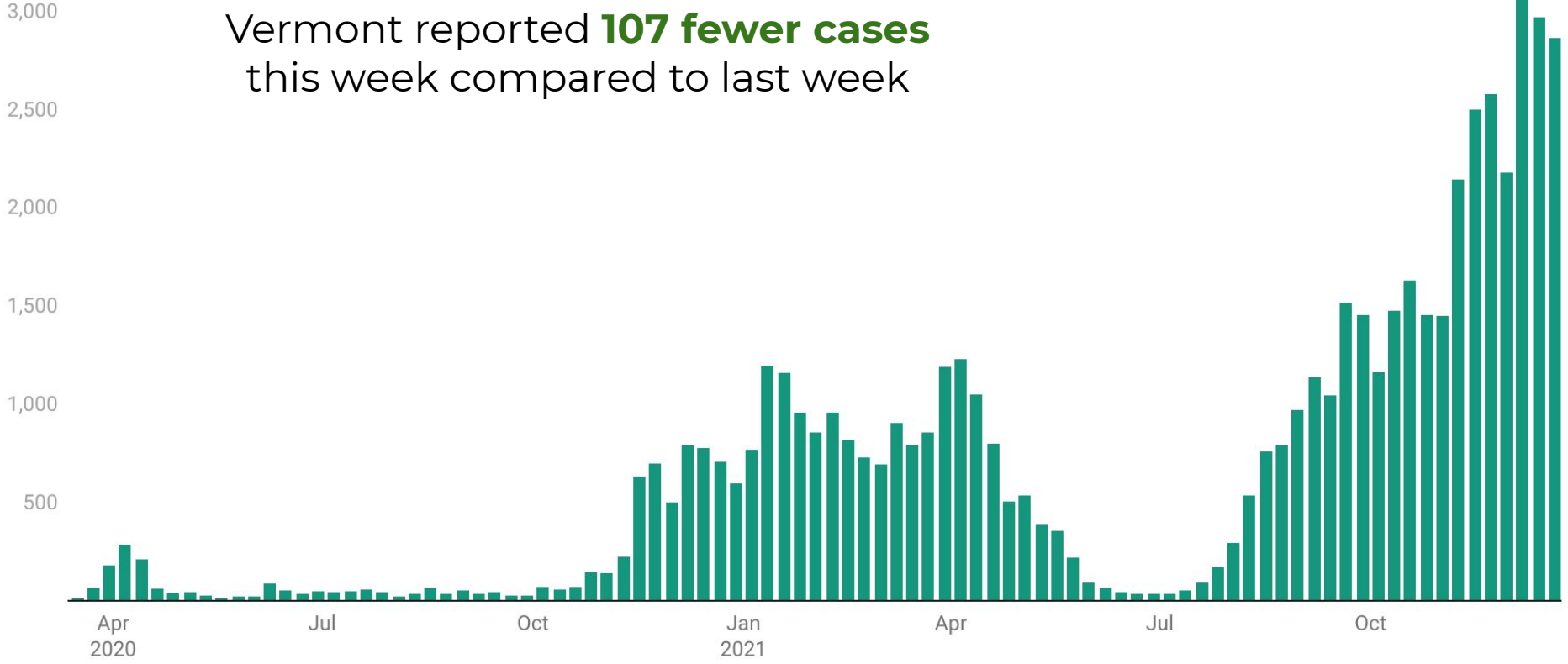
Fall 2021 Fall 2020





# Vermont New Weekly COVID-19 Cases

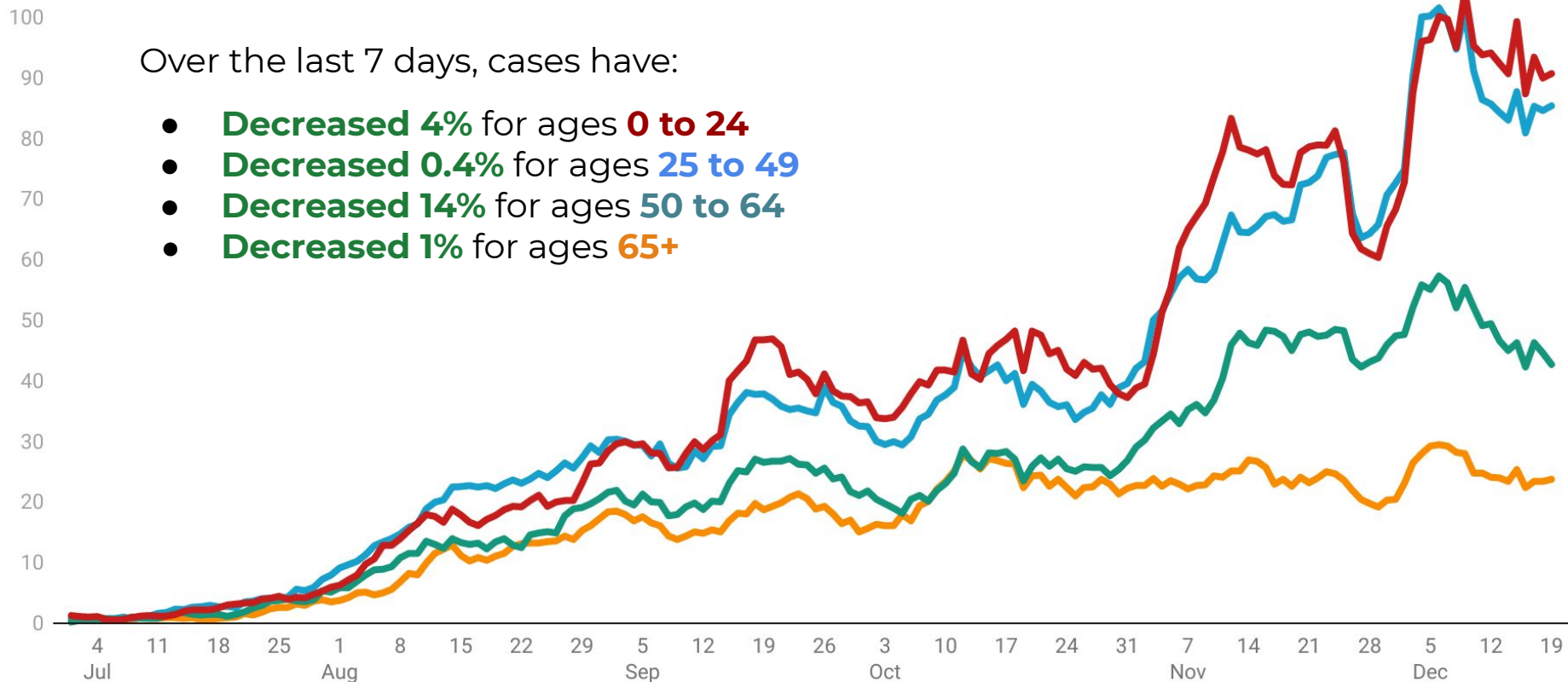
Vermont reported **107 fewer cases** this week compared to last week



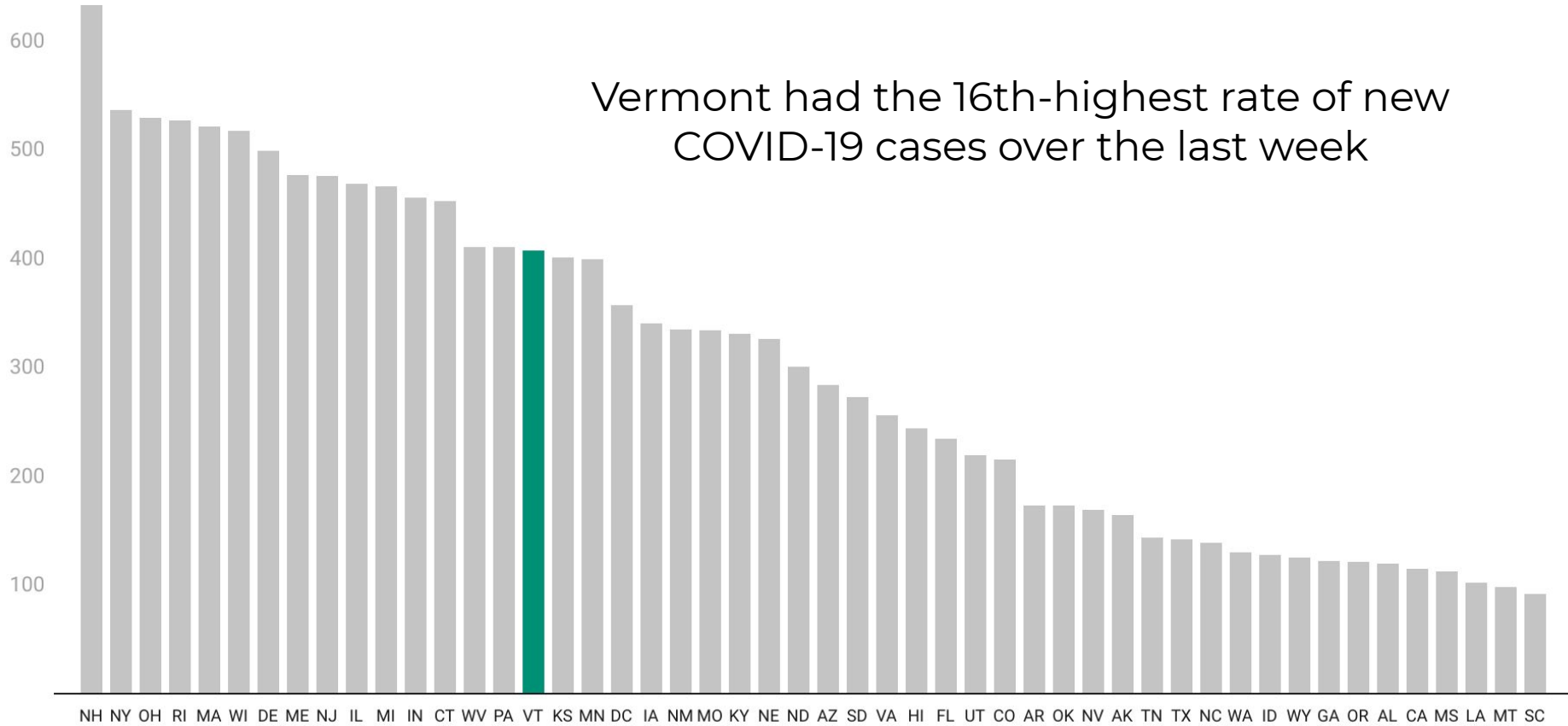
Source: VDH—December 20, 2021; created with Datawrapper

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

— 0 to 24 — 24 to 49 — 50 to 64 — 65+

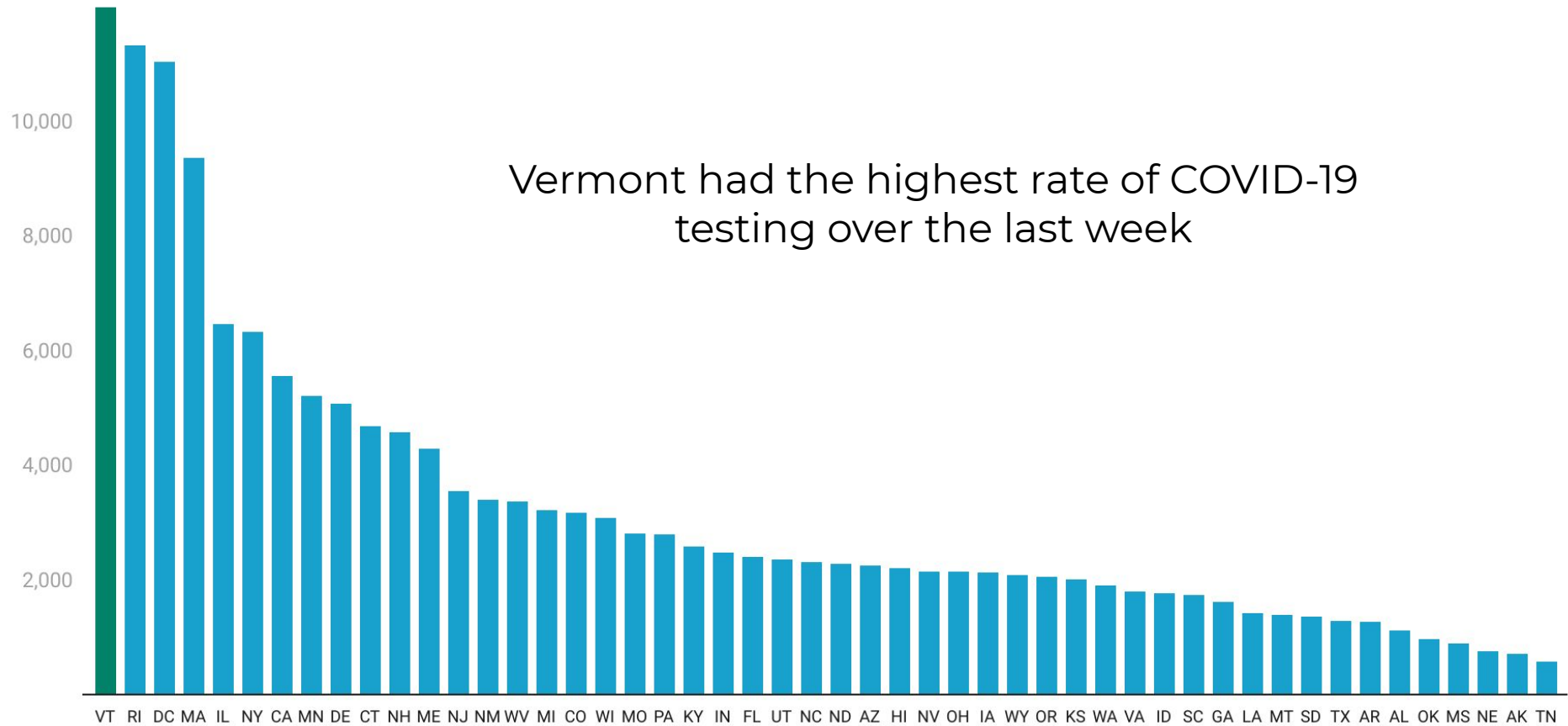


# National COVID-19 Case Rates Per 100K Last 7 Days



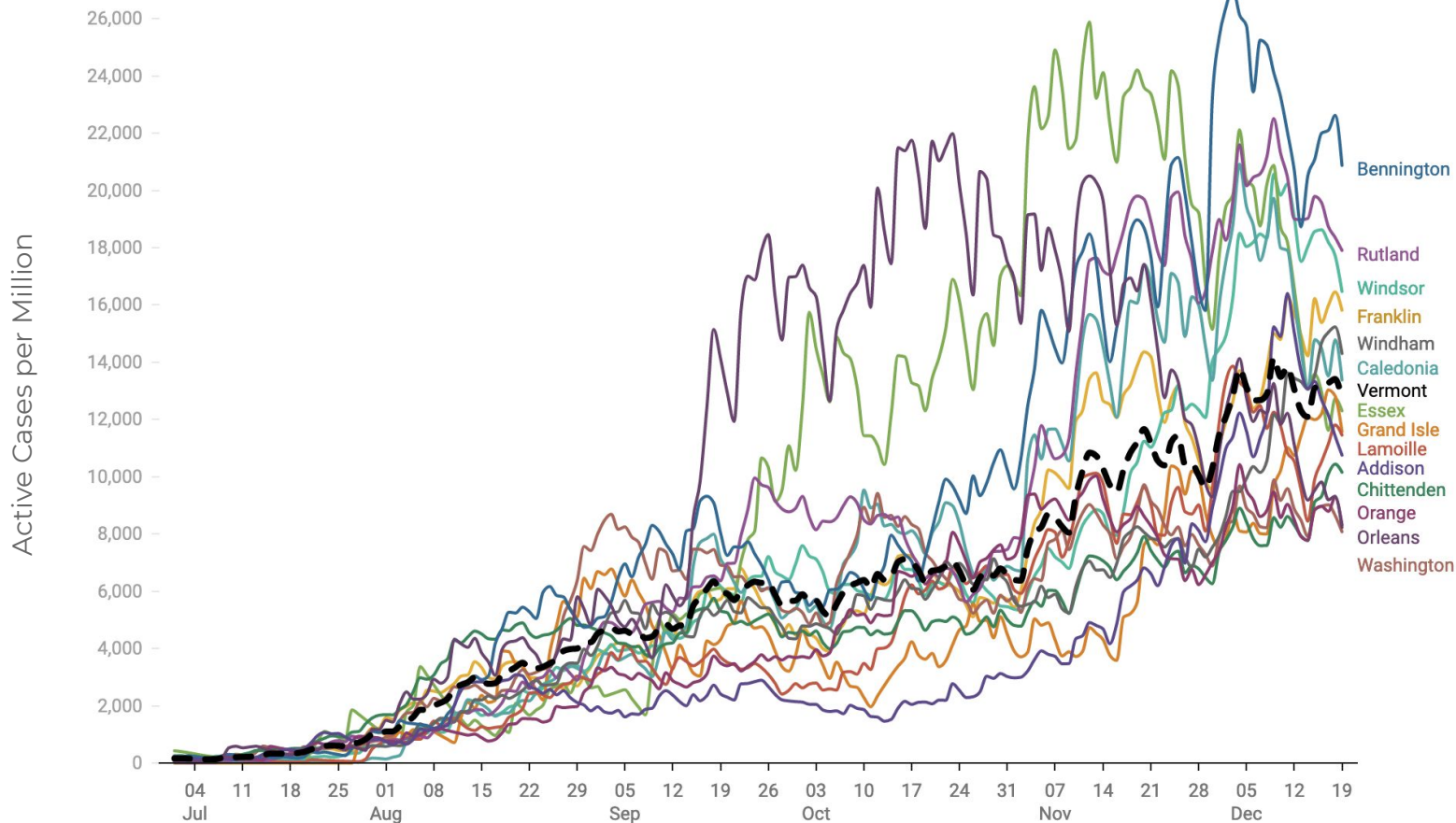
Source: CDC—December 20, 2021; Created with Datawrapper; Maryland excluded due to inability to report resulting from cyber incident

# COVID-19 Testing Per 100K Last 7 Days



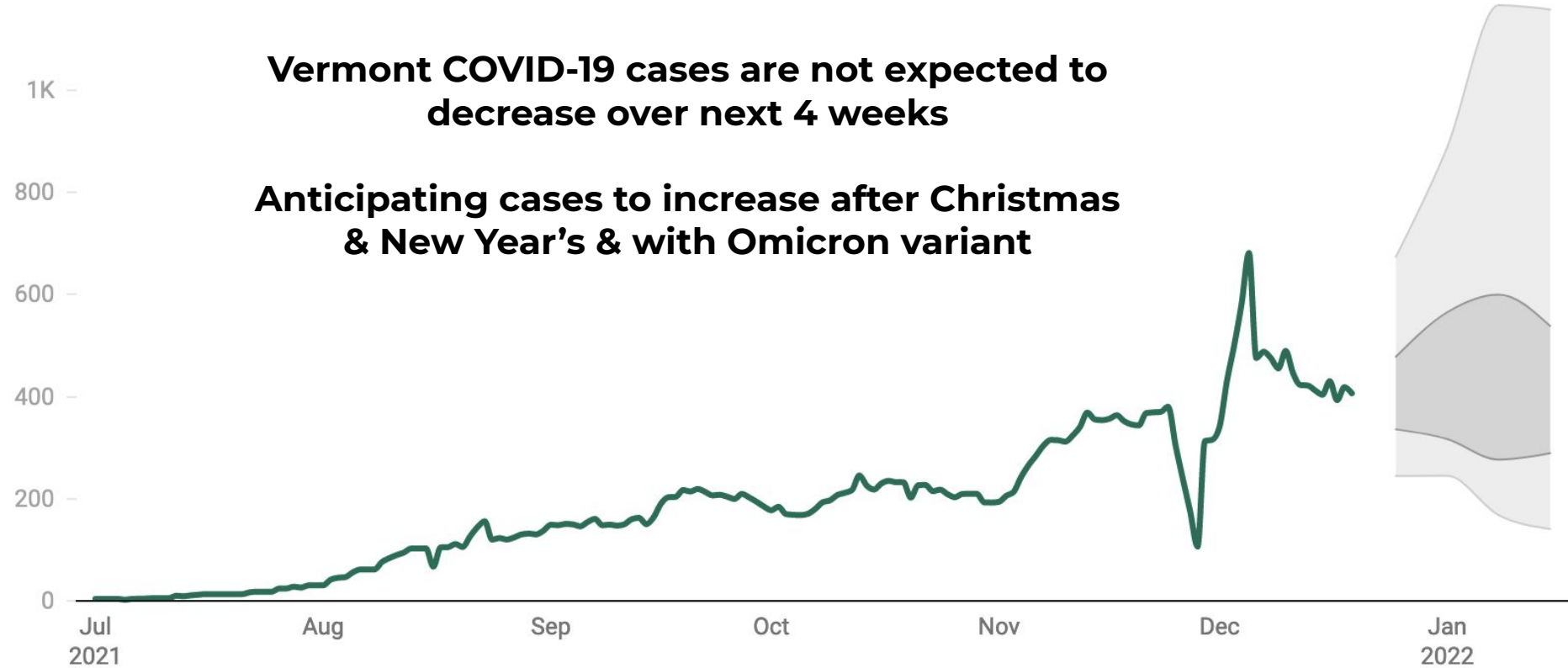
Vermont had the highest rate of COVID-19 testing over the last week

# Active Cases in Vermont Counties



# VT COVID-19 Infection Confidence Intervals

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

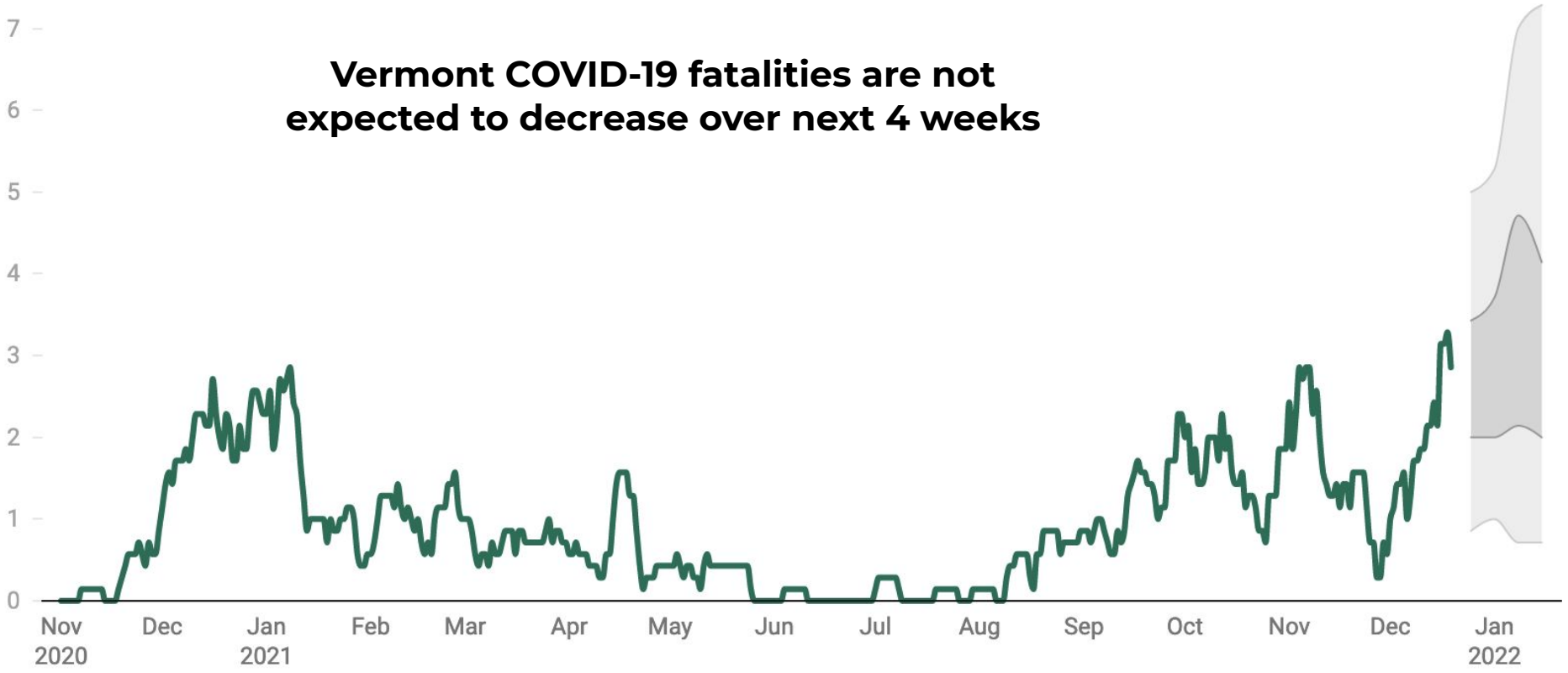


**Vermont COVID-19 cases are not expected to decrease over next 4 weeks**

**Anticipating cases to increase after Christmas & New Year's & with Omicron variant**

# US COVID-19 Death Confidence Intervals

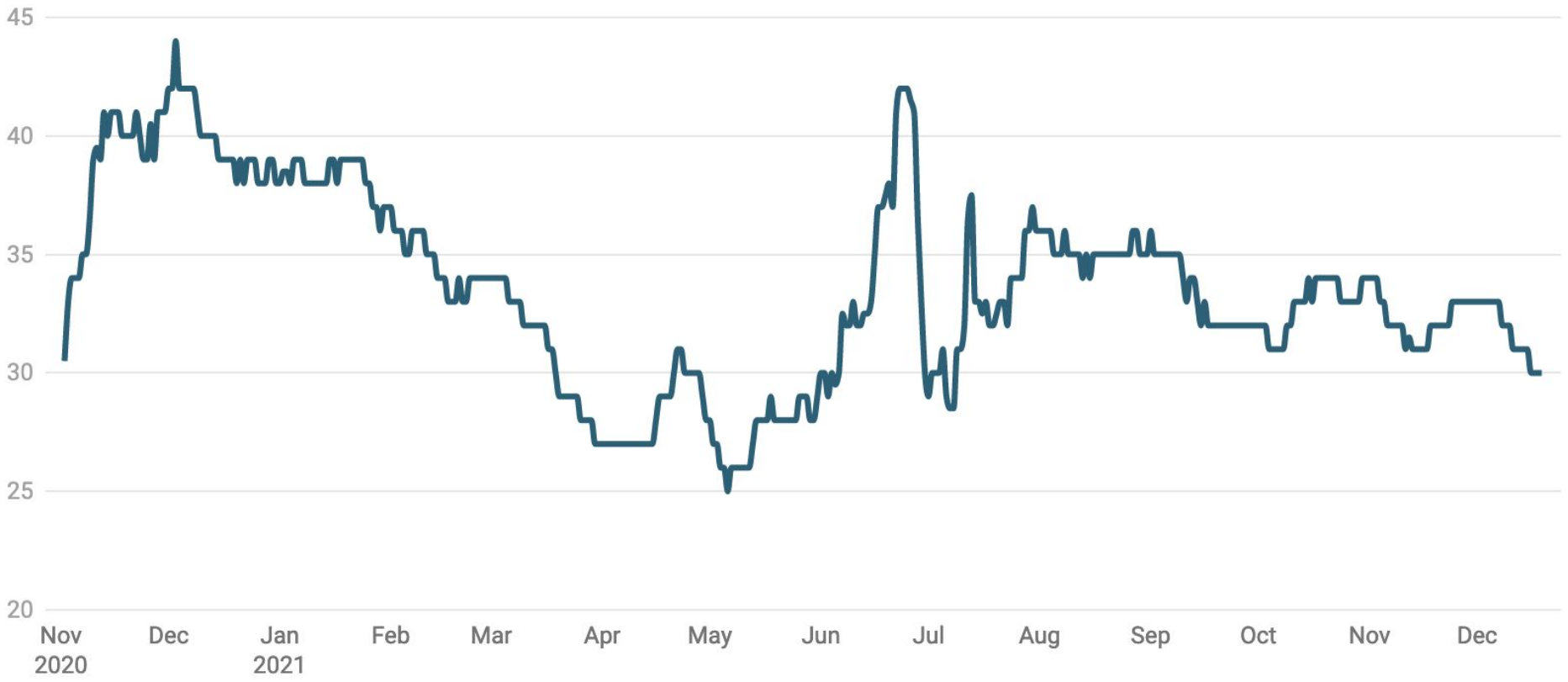
Calculated as a 7-day mean. Inner and outer bands represent 50% and 95% confidence intervals, respectively.



Source: Johns Hopkins University & CDC—December 21, 2021

# Age of Infected Vermonters

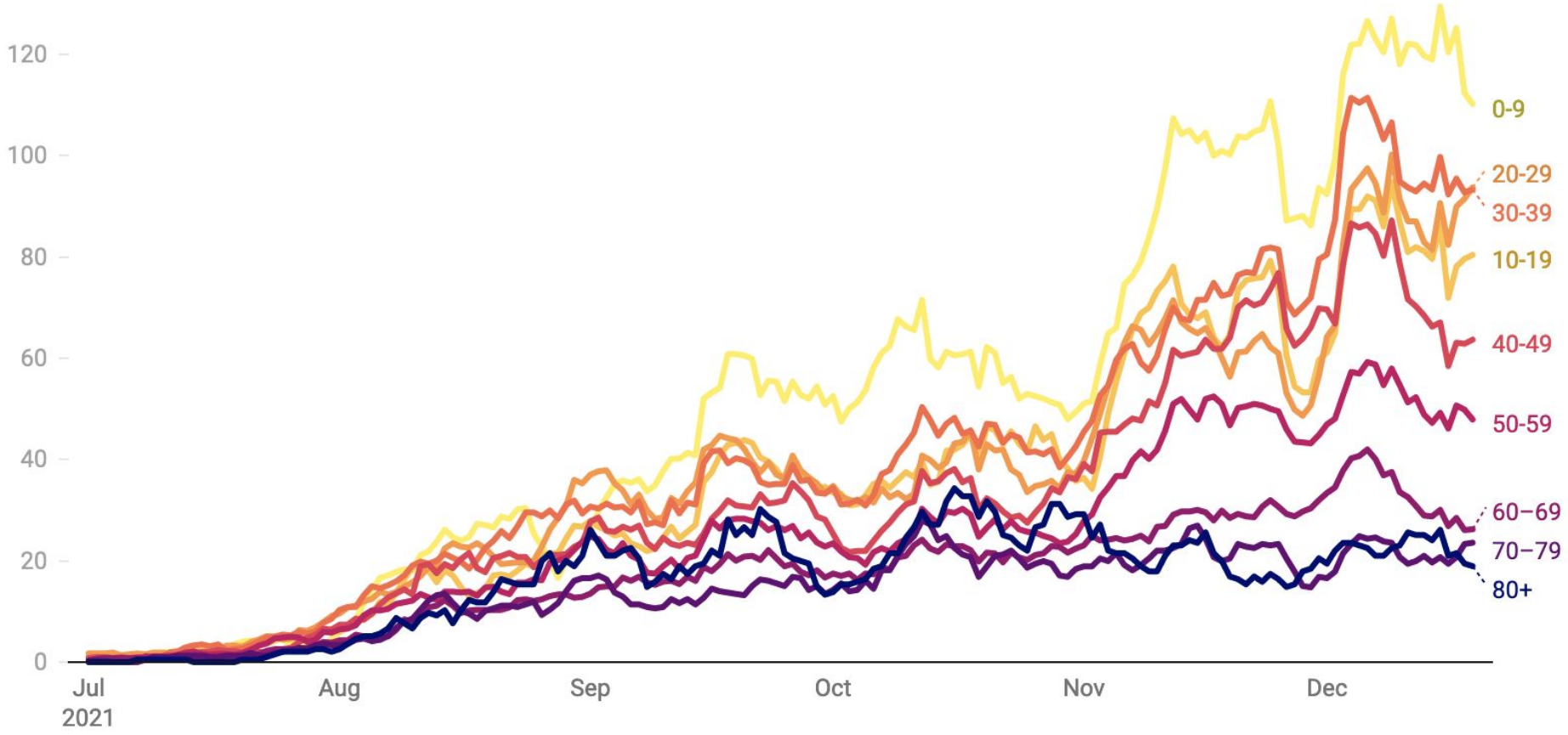
Median age of COVID positive individuals in VT over the last 14 days.



Source: VDH—December 21, 2021; created with Datawrapper



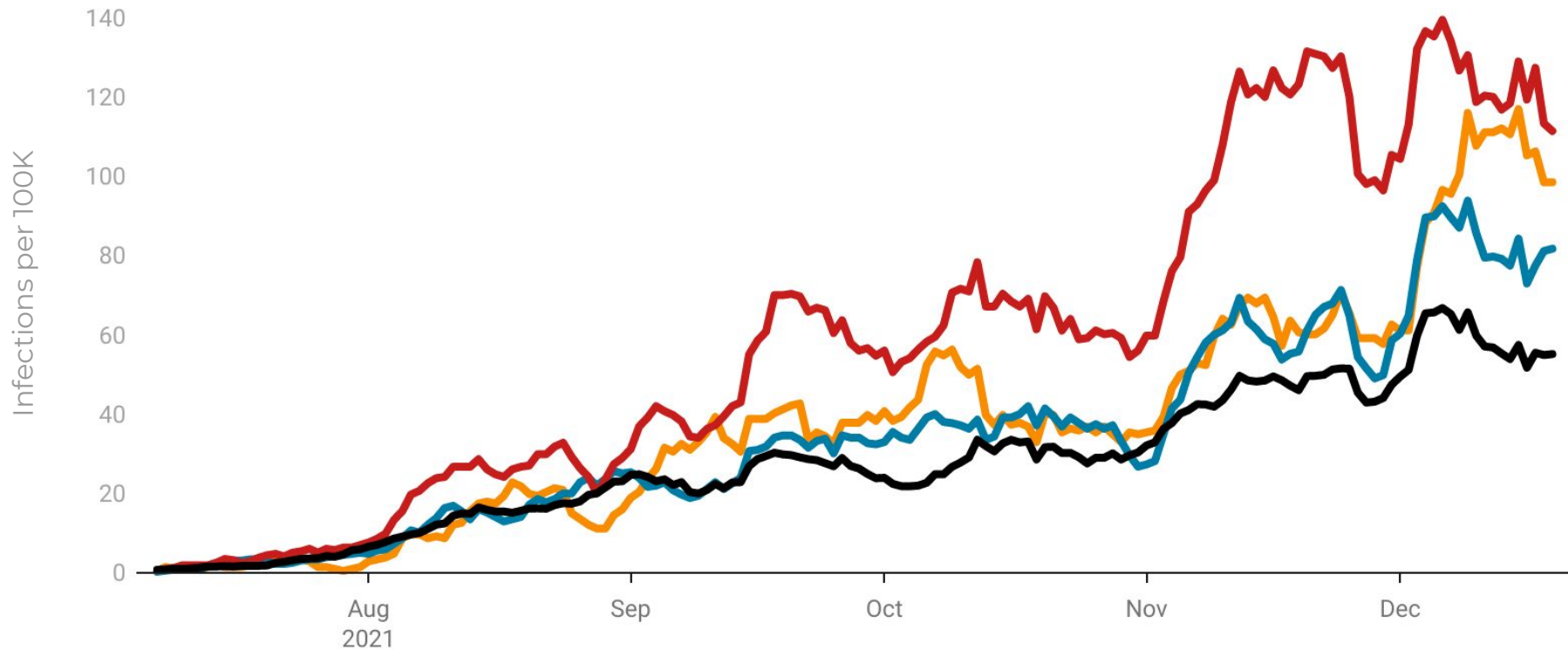
# VT COVID-19 Infections per 100K by Age Group



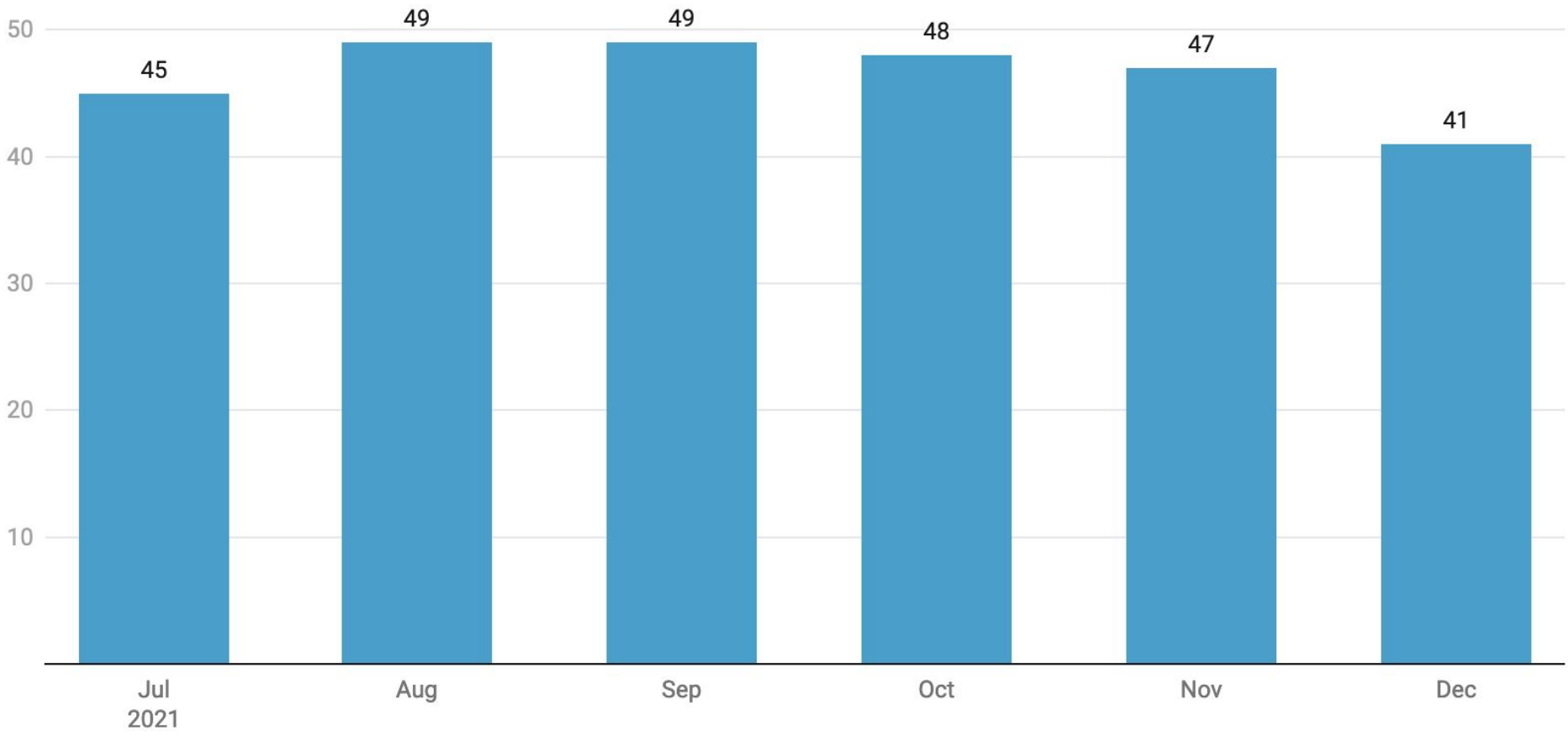
Source: VDH—December 21, 2021; created with Datawrapper

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

0-4 5-11 12-18 19+



# Median Age of VT Breakthrough Infections by Month

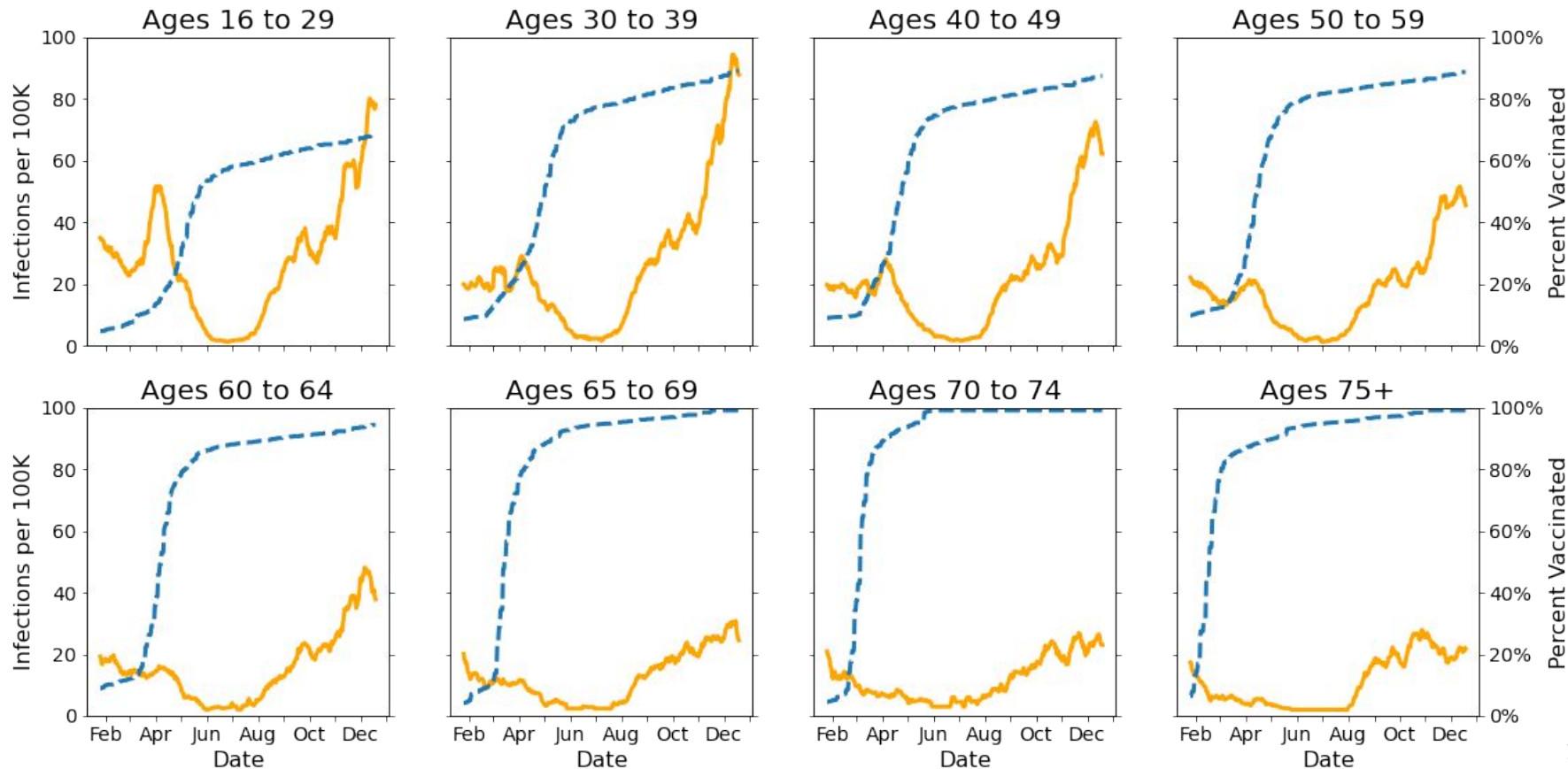


Source: Vermont Dept. of Health—December 21, 2021; created with Datawrapper

# Vermont Case Rate & Vaccination by Age Band

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

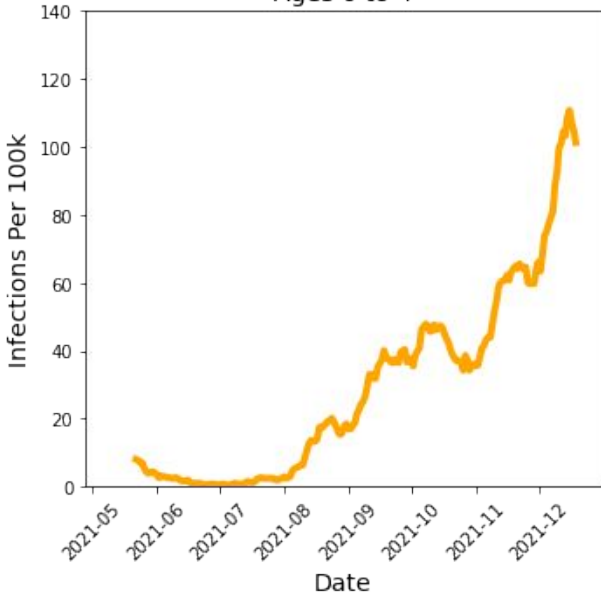
— Percent Received First Vaccine Dose



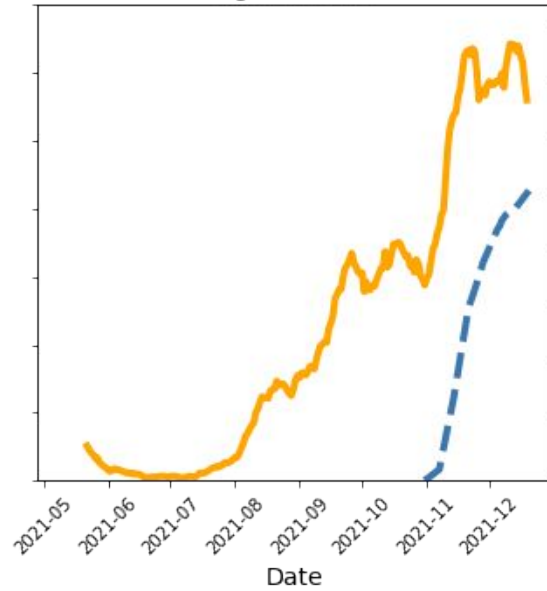
# Vermont Case Rate & Vaccination by Age Band

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

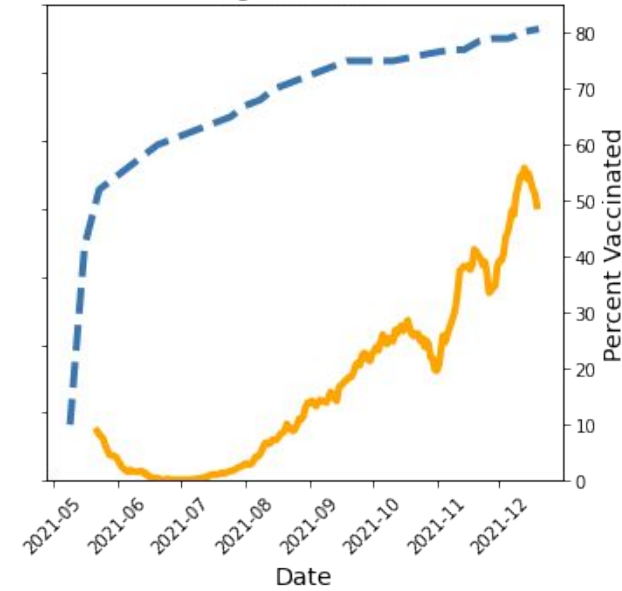
Ages 0 to 4



Ages 5 to 11

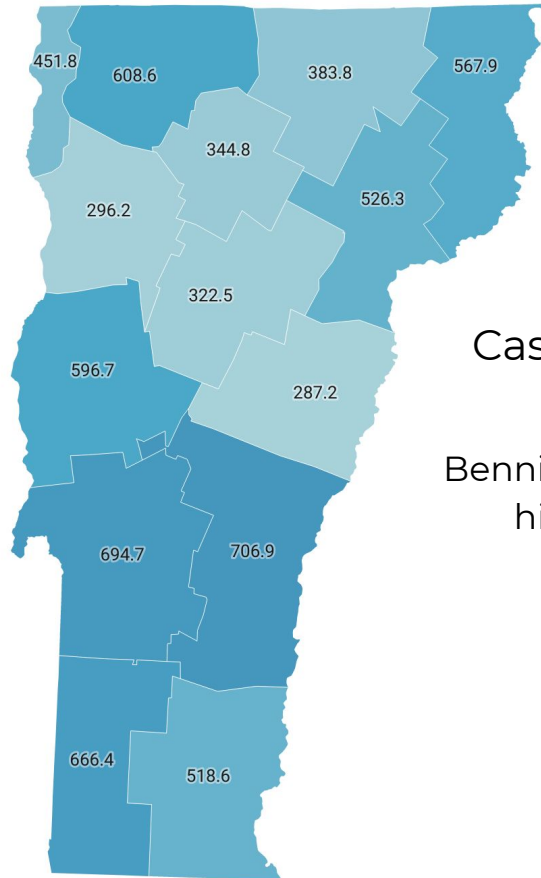


Ages 12 to 15



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

Results Reported December 7 to 13

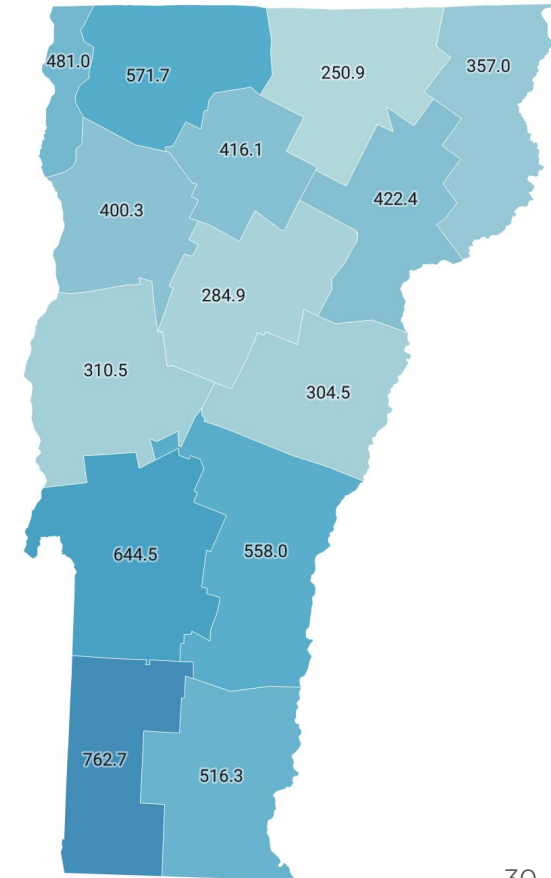


Case rates **decreased in 9 of 14** counties this week

Bennington & Rutland Counties reporting highest levels of spread statewide

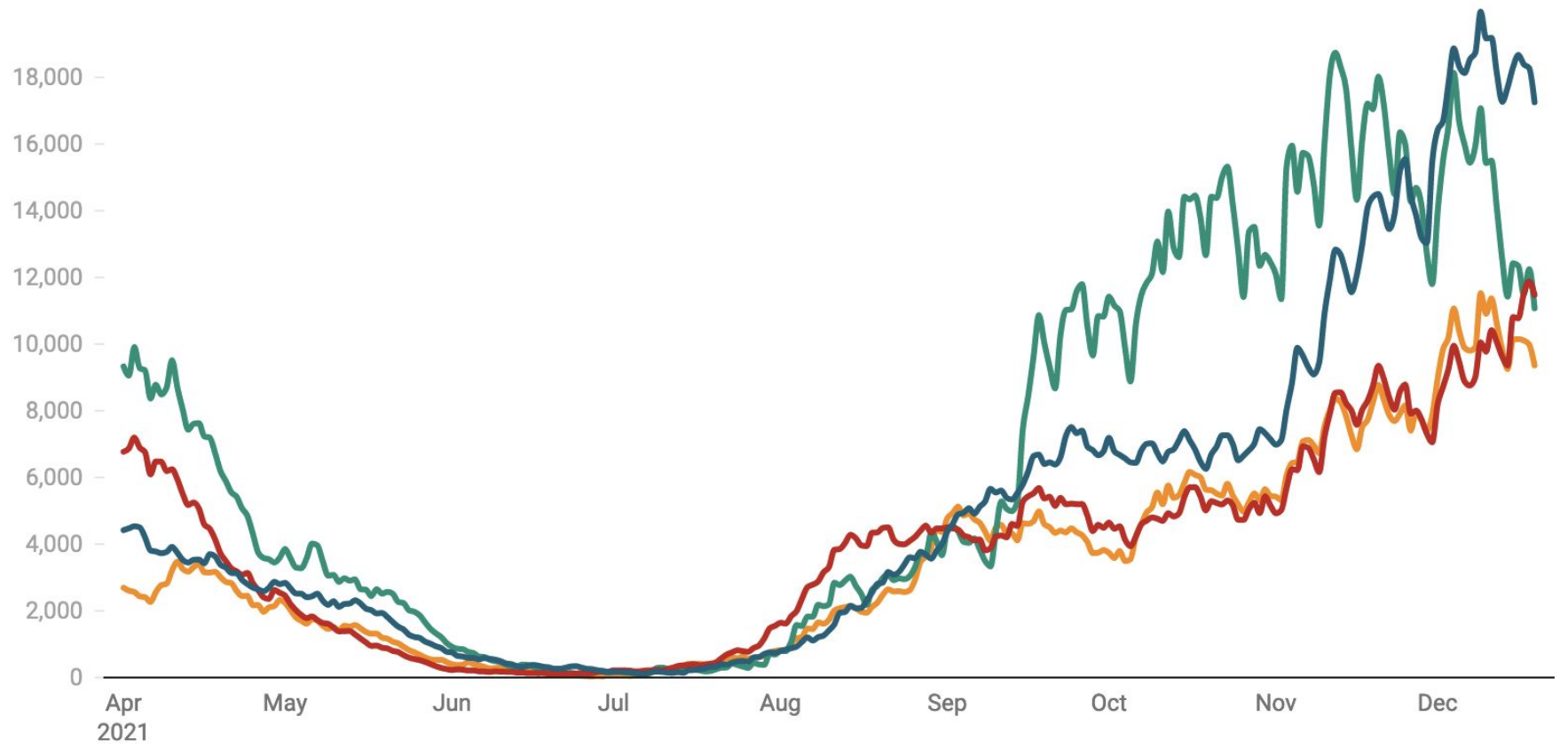
## Vermont Weekly Cases by County (per 100,000)

Results Reported December 14 to 20



# Active Cases per Million in Vermont Regions

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



# 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%

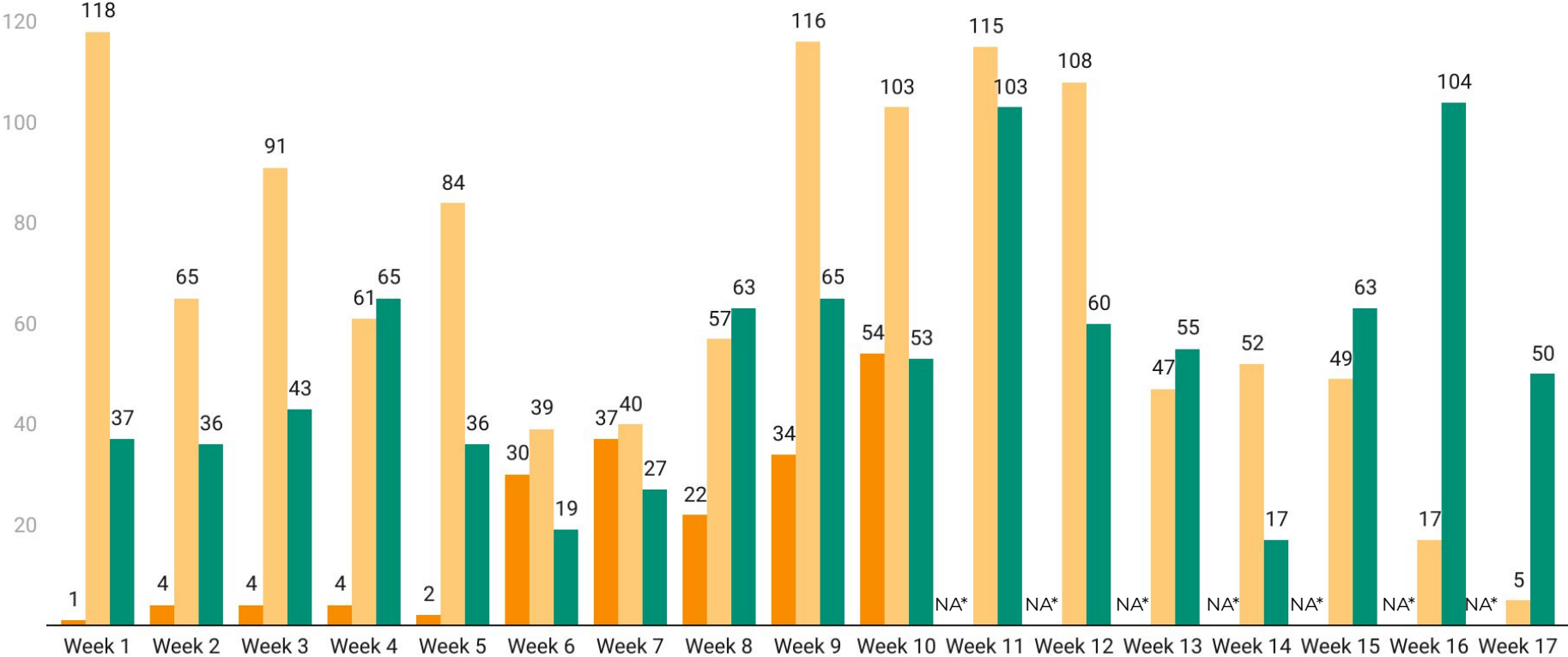
Week 1: **37 cases** out of 12,623 tests  
 Week 2: **36 cases** out of 7,434 tests  
 Week 3: **43 cases** out of 3,053 tests  
 Week 4: **65 cases** out of 6,497 tests  
 Week 5: **36 cases** out of 4,878 tests  
 Week 6: **19 cases** out of 4,516 tests  
 Week 7: **27 cases** out of 3,536 tests  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

Week 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  
 Week 16: **104 cases** out of 6,079 tests  
 Week 17: **50 cases** out of 6,203 tests



# Vermont Higher Education Cases By Semester

■ Fall 2020
 ■ Spring 2021
 ■ Fall 2021



Source: Vermont Higher Education Institutions—December 20, 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.

# Vermont Higher Education Comparison

	Spring Semester 2021	Fall Semester 2021
<b>Enrollment</b>	~20,500	~28,500
<b>VT Cases During Semester</b>	13,653	29,606
<b># of Cases</b>	1,167	896
<b>% of VT's Cases</b>	8.5%	3.0%
<b># of Tests</b>	379,224	98,148

# Active Outbreaks in Long Term Care Facilities

Facility Name	Total COVID-19 Cases
Burlington Health & Rehabilitation	23
Springfield Rivers Nursing & Rehabilitation	Not Shown
St. Johnsbury Health & Rehabilitation	Not Shown
Thompson House, <i>Brattleboro</i>	Not Shown
<b>Total</b>	<b>23</b>

Source: Vermont Department of Health—December 21, 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

**23% Decrease** in the 7-Day hospitalization average over the past week

**73%** of hospitalizations among the unvaccinated over the last 7 days

75

50

25

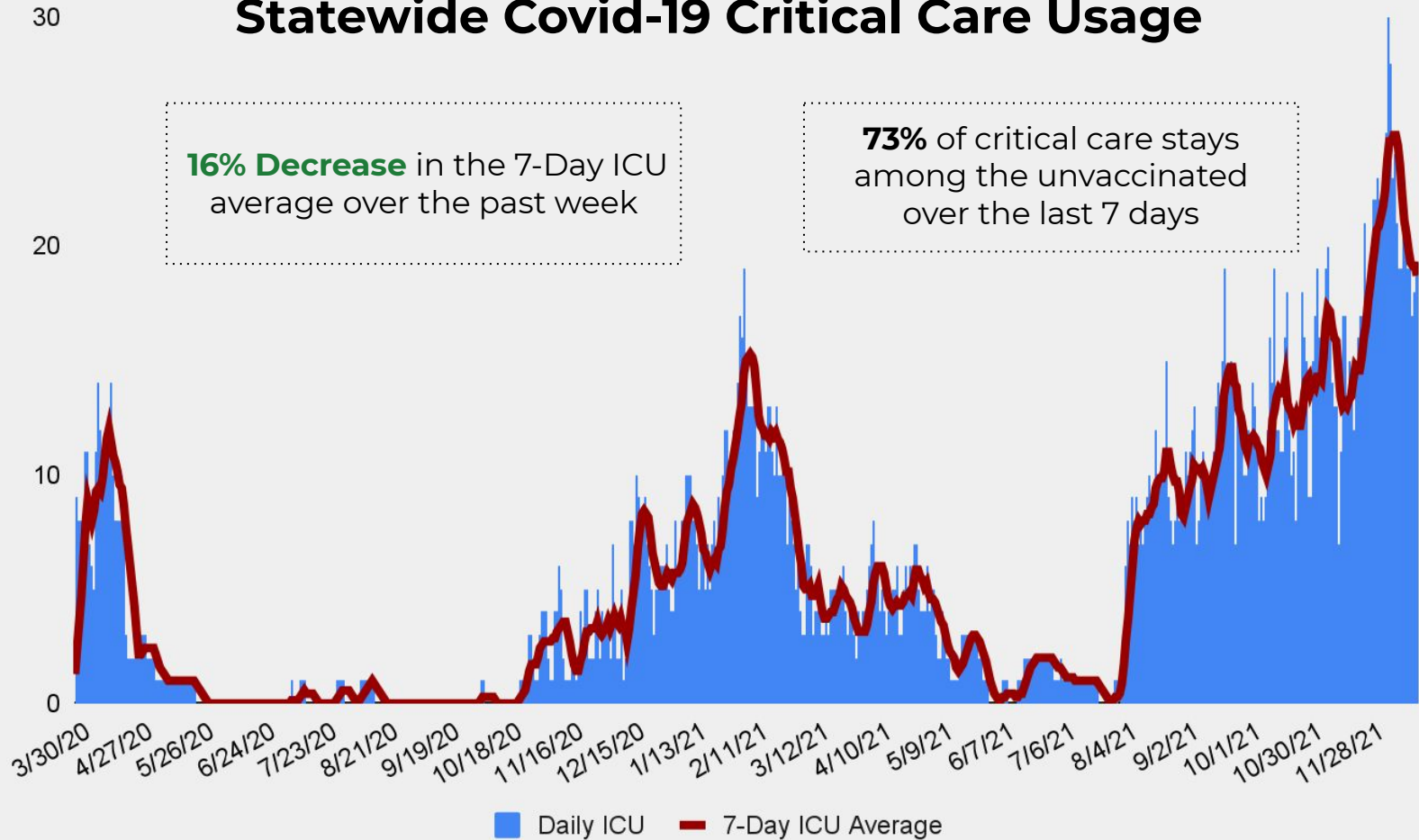
0

3/30/20 4/27/20 5/26/20 6/24/20 7/23/20 8/21/20 9/19/20 10/18/20 11/16/20 12/15/20 1/13/21 2/11/21 3/12/21 4/10/21 5/9/21 6/7/21 7/6/21 8/4/21 9/2/21 10/1/21 10/30/21 11/28/21

■ Daily Hospitalizations ■ 7-Day Hospitalization Average

Source: Vermont Department of Health—December 21, 2021

# Statewide Covid-19 Critical Care Usage



**16% Decrease** in the 7-Day ICU average over the past week

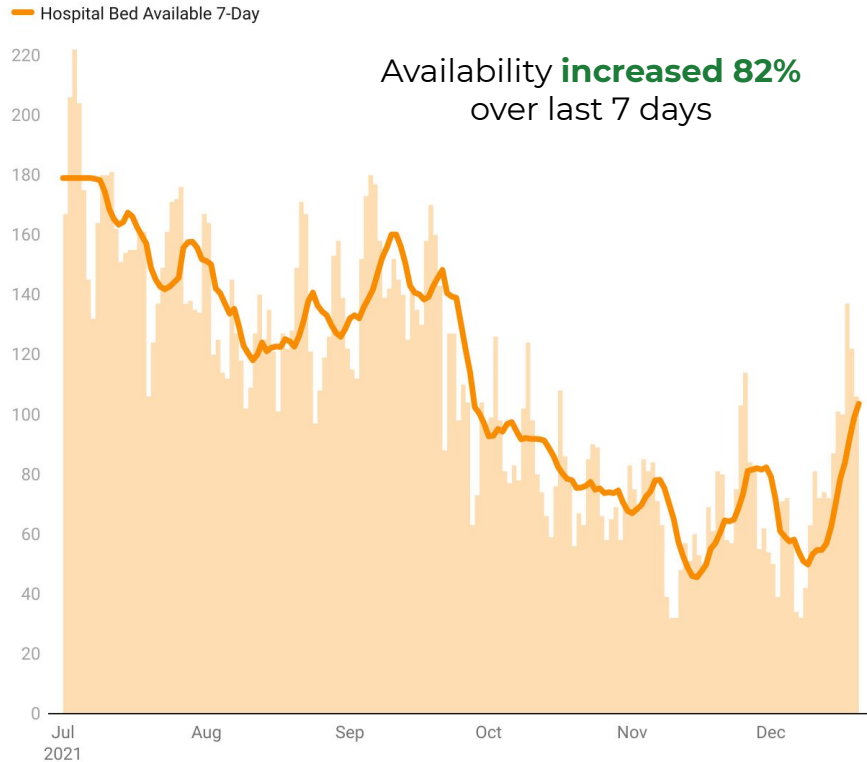
**73%** of critical care stays among the unvaccinated over the last 7 days

Source: Vermont Department of Health—December 21, 2021

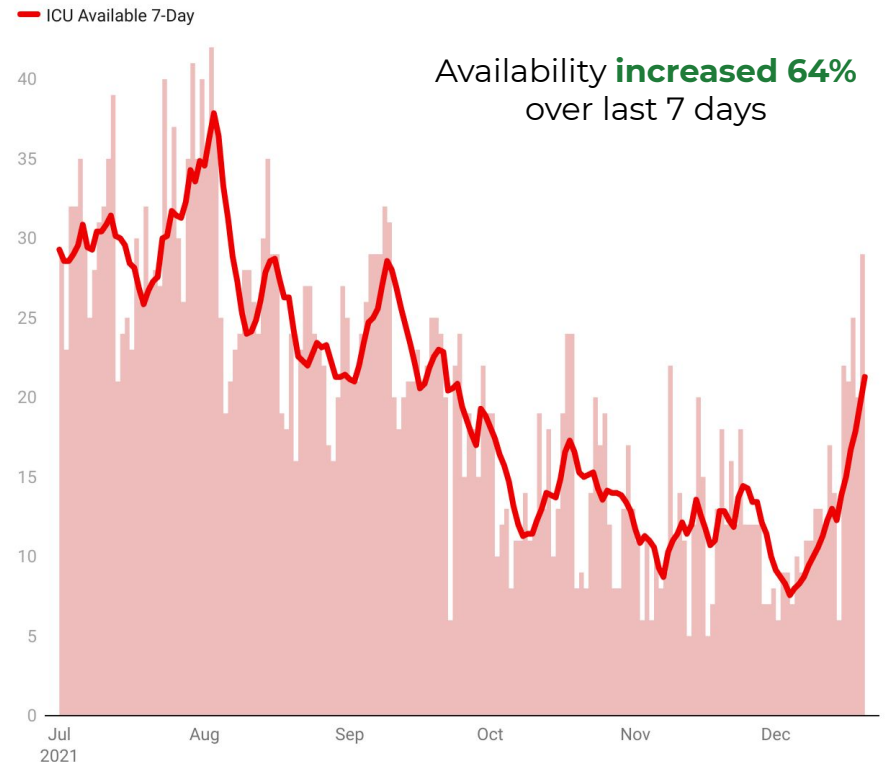
# Vermont Hospital Metrics

## (7-Day Averages)

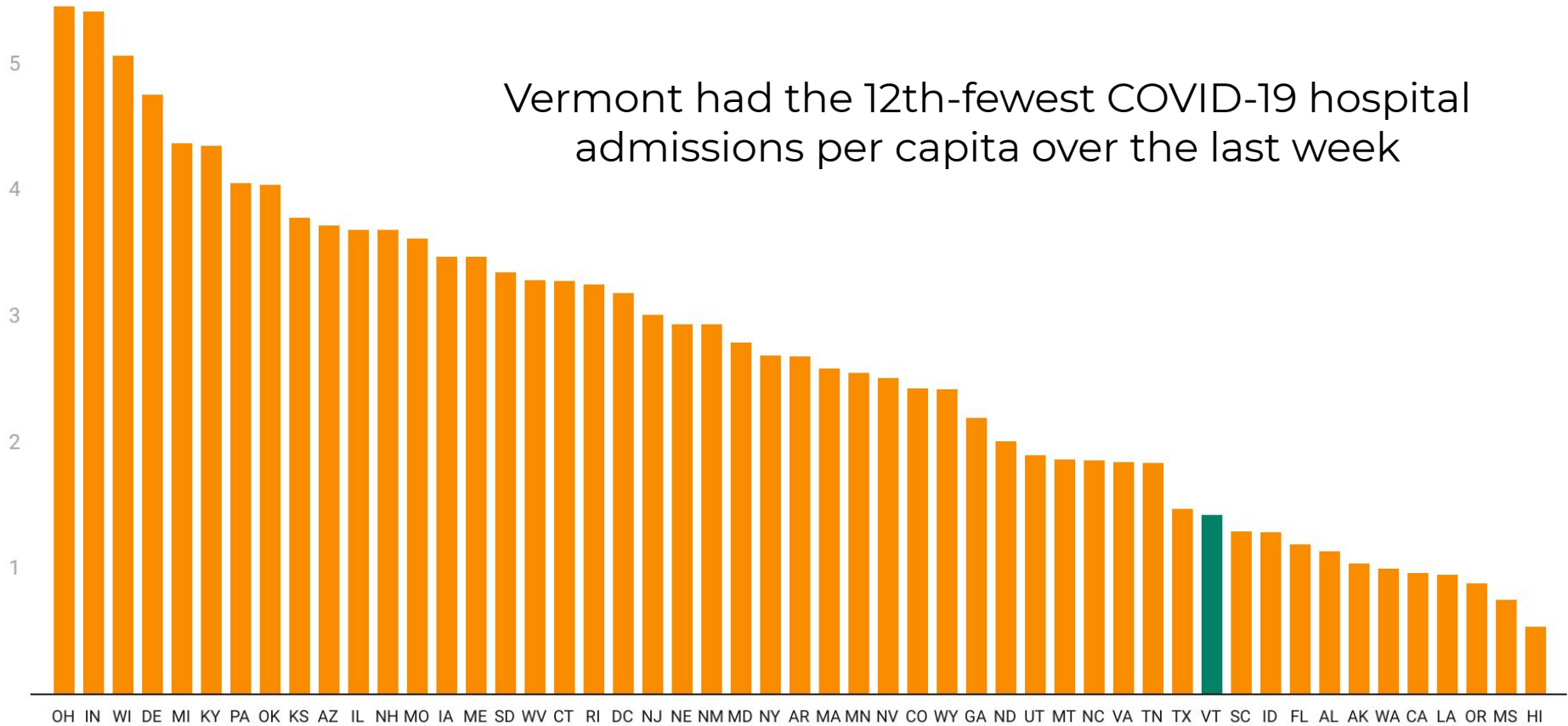
### Vermont Hospital Beds Available Since July 1, 2021



### Vermont ICU Beds Available Since July 1, 2021



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

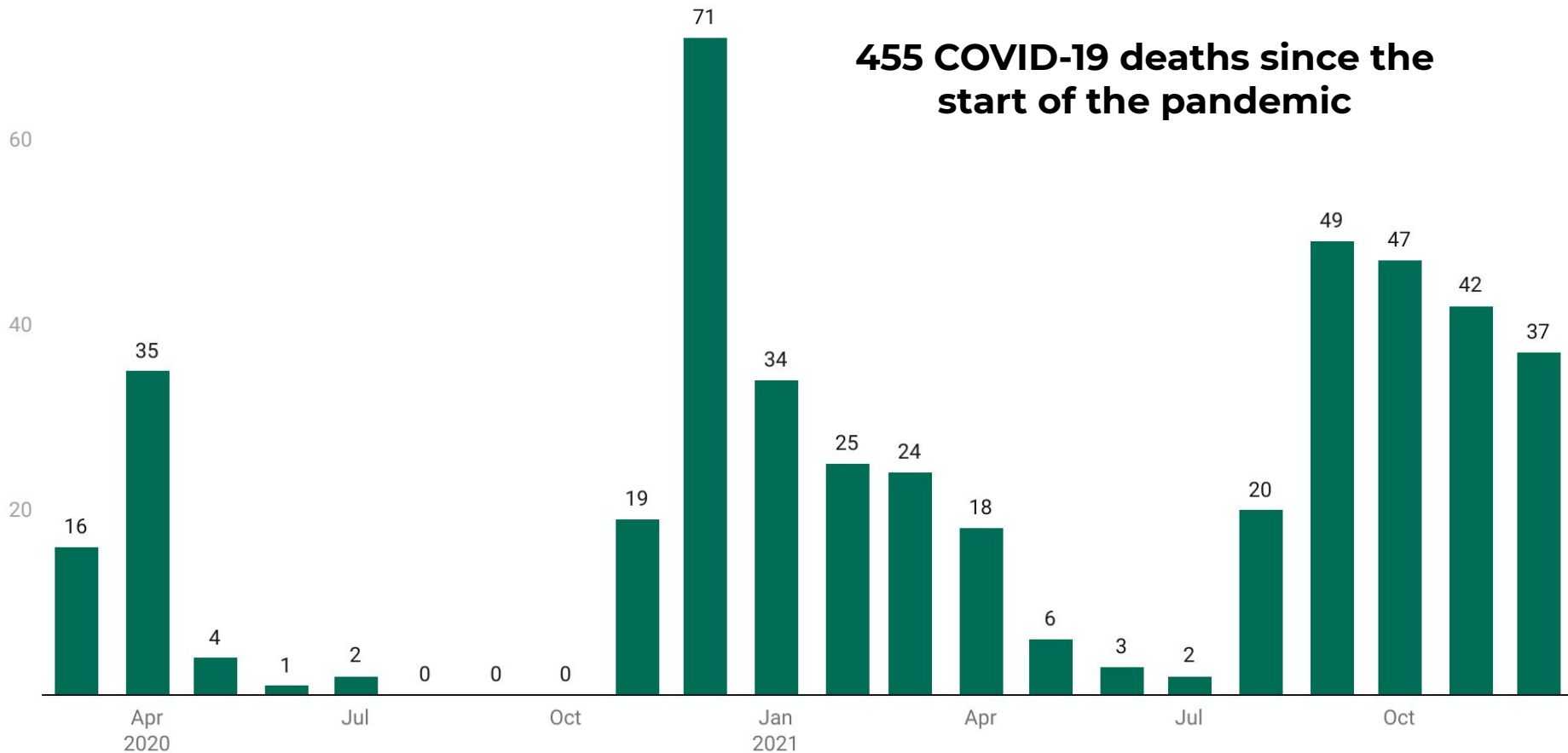




# Vermont Fatality Data



# Monthly Covid-19 Deaths In Vermont



Source: Vermont Department of Health—December 21, 2021; deaths attributed to month in which death occurred rather than reported

# COVID-19 Deaths Per 100K Last 7 Days

8

6

4

2

Vermont had the 17th-fewest COVID-19 deaths per capita over the last week



Source: CDC—December 20, 2021; Created with Datawrapper; Maryland excluded due to inability to report resulting from cyber incident

# Vermont Vaccination Data

# Vermont CDC Vaccine Scorecard

Metric	Figure	State Ranking
<b>Doses Administered per 100K</b>	<b>195,467</b>	<b>1</b>
<b>% At Least 1 Dose (5+ Population)</b>	<b>92.5%</b>	<b>2 (tied)</b>
<b>% Fully Vaccinated (5+ Population)</b>	<b>80.3%</b>	<b>1</b>
<b>% At Least 1 Dose (Full Population)</b>	<b>88.2%</b>	<b>2</b>
<b>% Fully Vaccinated (Full Population)</b>	<b>76.6%</b>	<b>1</b>
<b>% Fully Vaccinated (65 &amp; Over)</b>	<b>95%+</b>	<b>1</b>

# Percent of 5 to 11 Population Starting Vaccination

60

50

40

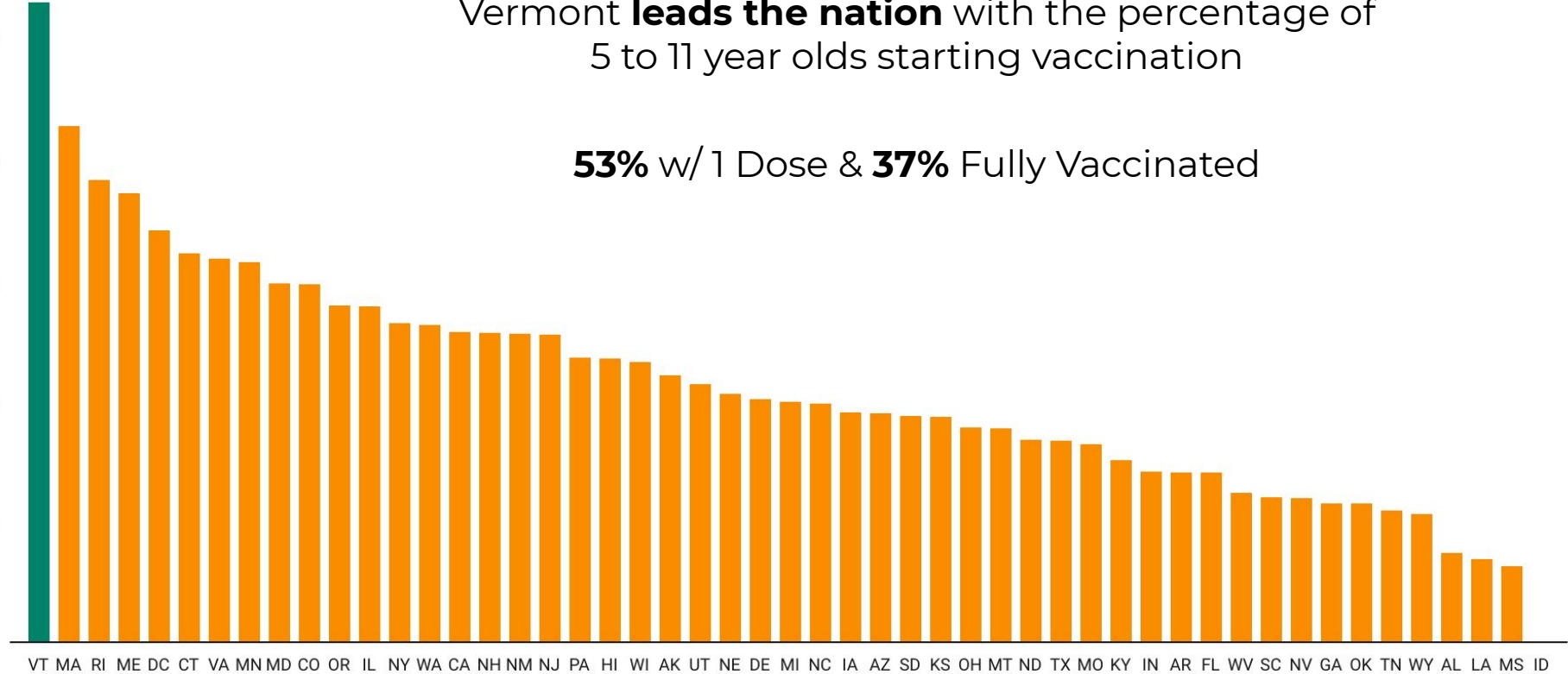
30

20

10

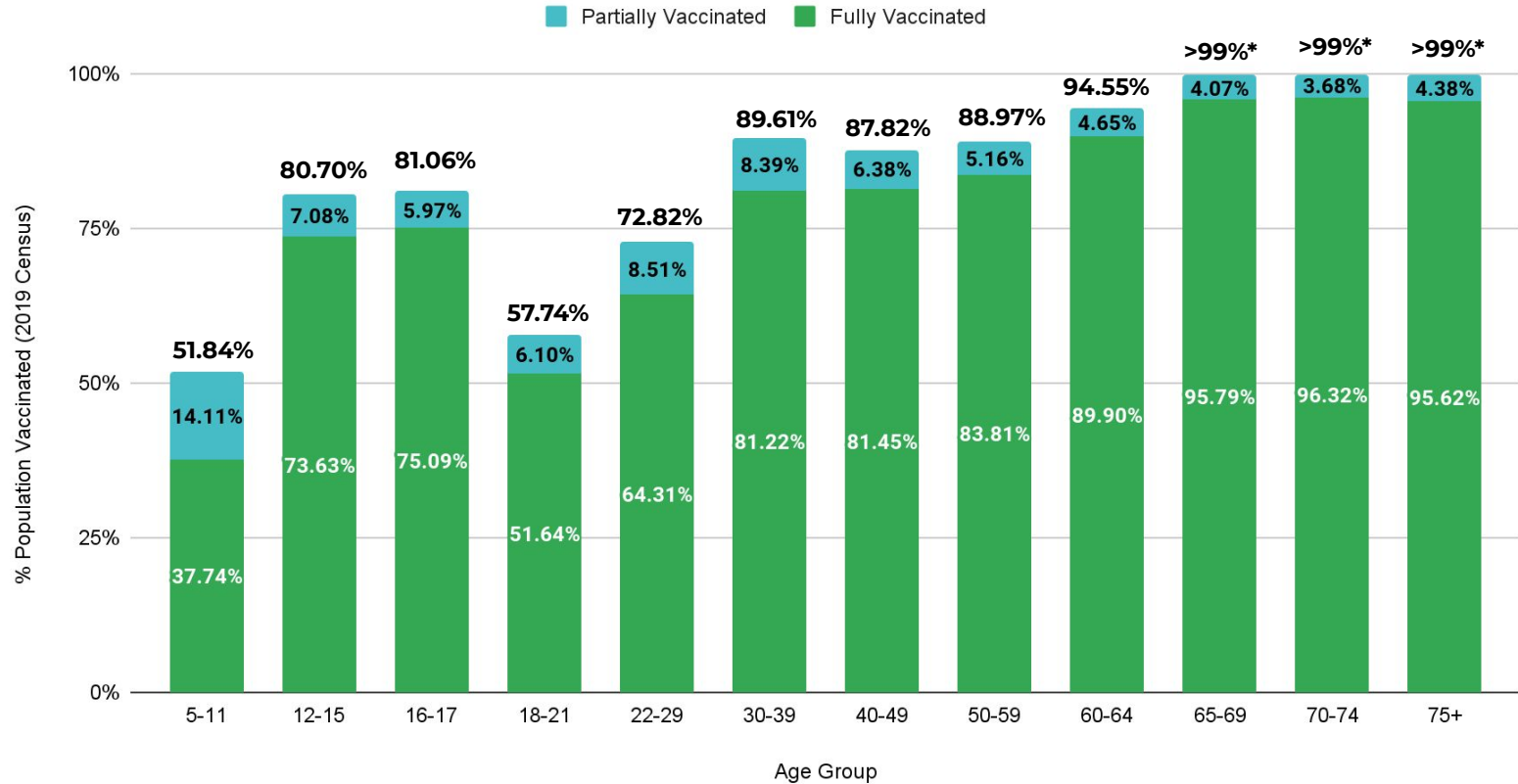
Vermont **leads the nation** with the percentage of 5 to 11 year olds starting vaccination

**53%** w/ 1 Dose & **37%** Fully Vaccinated



# Vermont Vaccination Progress

By Age Band





# Vermont CDC Booster Scorecard

Metric	Figure	State Ranking
<b>% of Fully Vaccinated w/ booster dose</b>	<b>45.4%</b>	<b>1</b>
<b>% of Fully vaccinated 18+ w/ booster doses</b>	<b>50.1%</b>	<b>1</b>
<b>% of Fully vaccinated 50+ w/ booster doses</b>	<b>62.1%</b>	<b>1</b>
<b>% of Fully vaccinated 65+ w/ booster doses</b>	<b>72.3%</b>	<b>2</b>

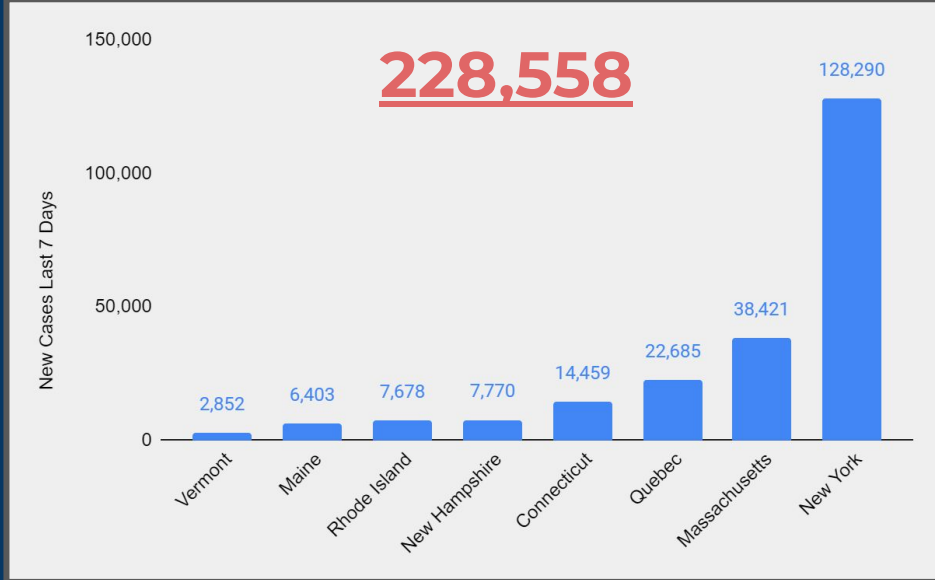
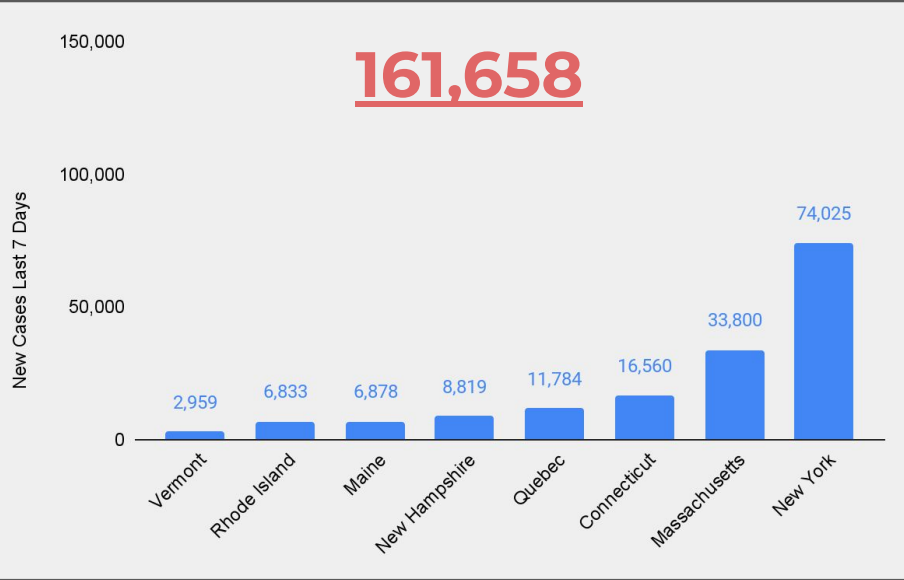
# Regional Data

# Northeast Regional Cases

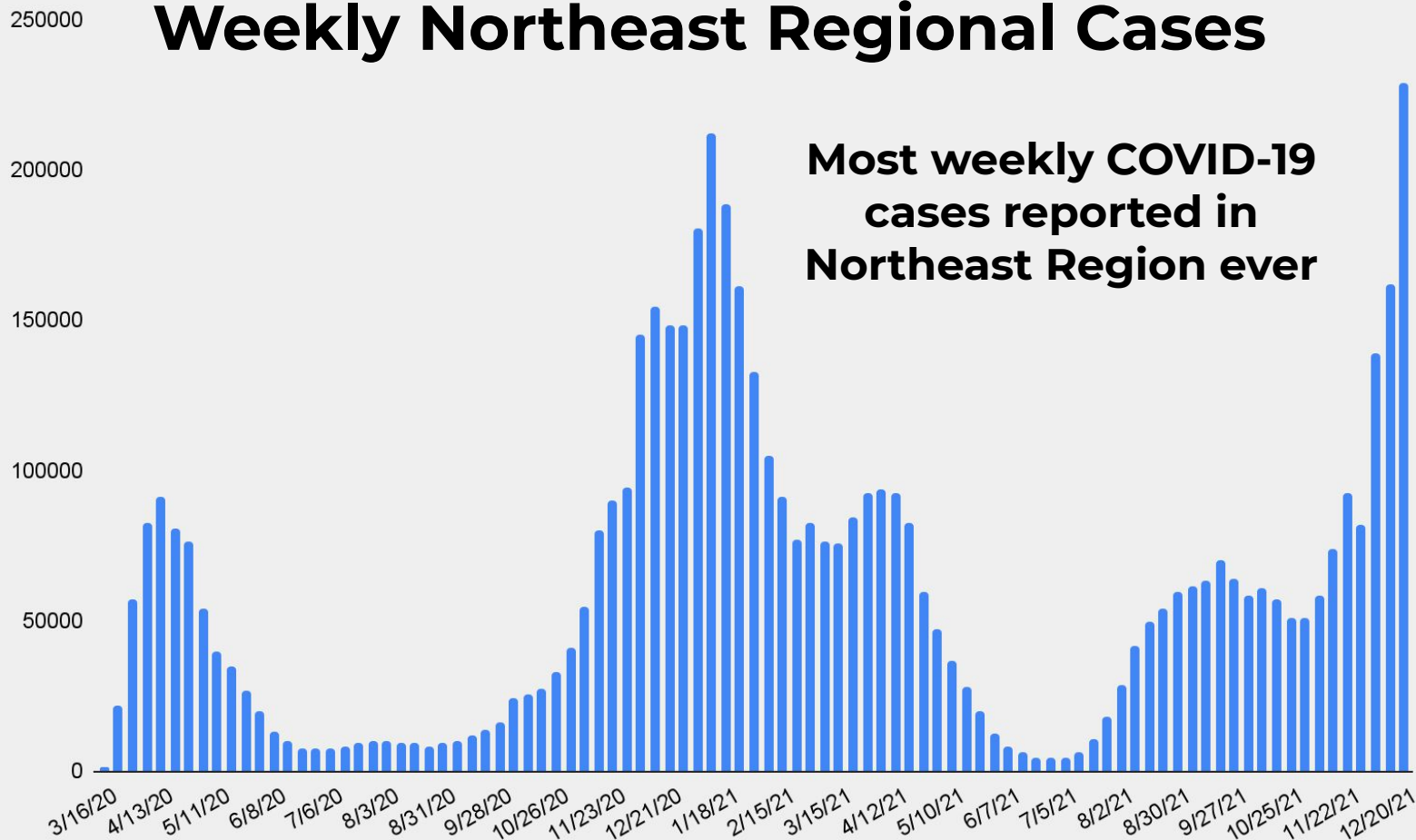
41.4% Increase in New Cases

New Cases December 7th to December 13th

New Cases December 14th to December 20th



# Weekly Northeast Regional Cases

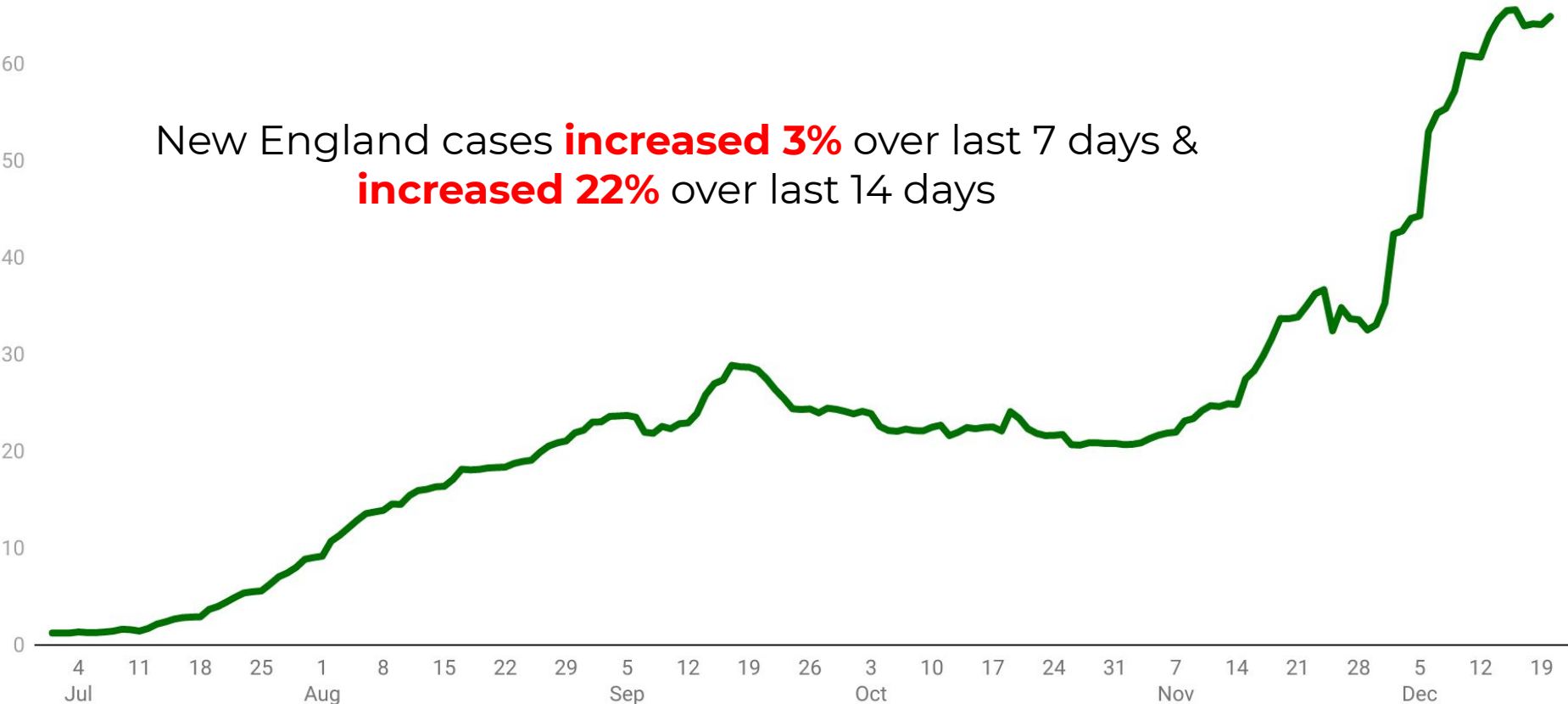


**Most weekly COVID-19 cases reported in Northeast Region ever**

Sources: State Health Depts.—December 20, 2021 (includes: CT, ME, MA, NH, NY, QC, RI & VT)

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

— New England Case Rate

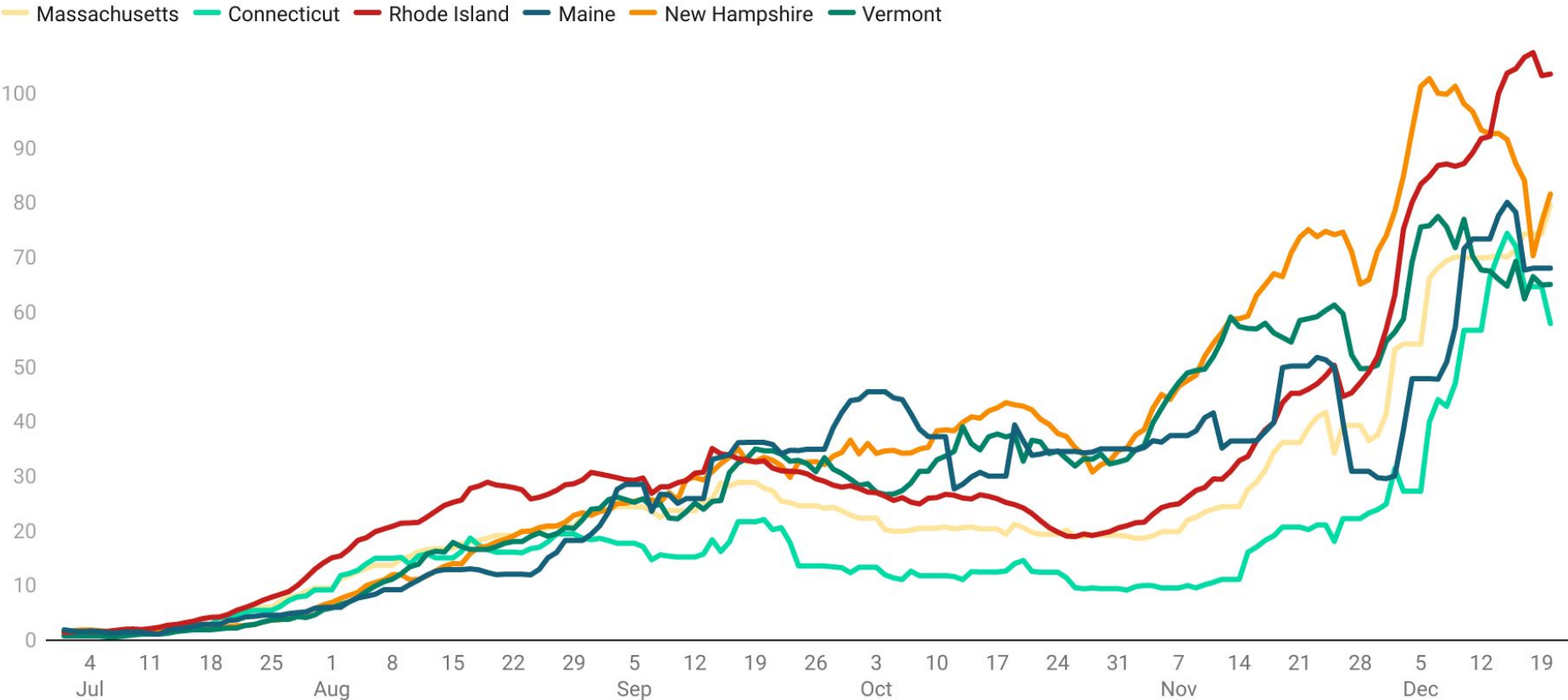


New England cases **increased 3%** over last 7 days & **increased 22%** over last 14 days

Sources: State Health Depts.—December 20, 2021 (includes: CT, ME, MA, NH, RI & VT)

# New England COVID-19 Case Trends

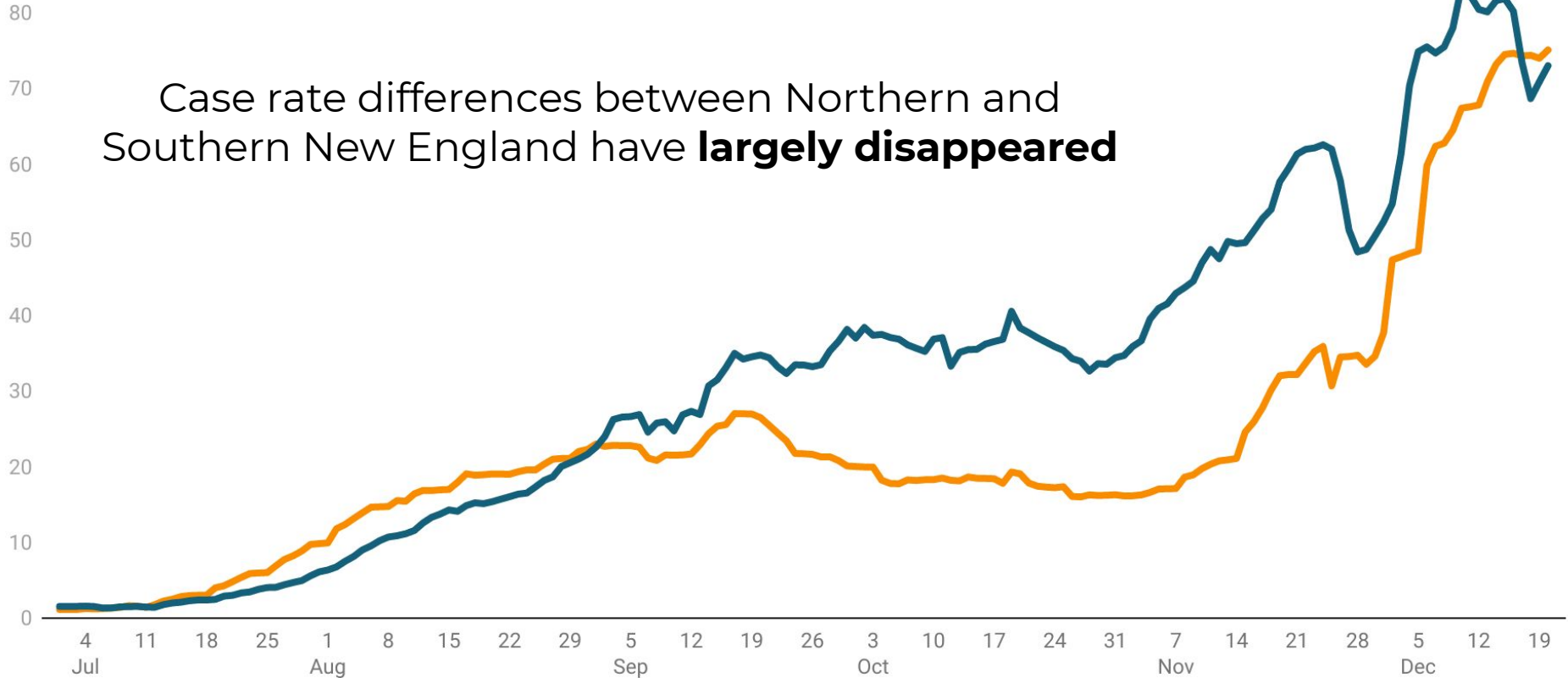
7-Day Average Cases Per 100K



Sources: State Health Depts.—December 20, 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



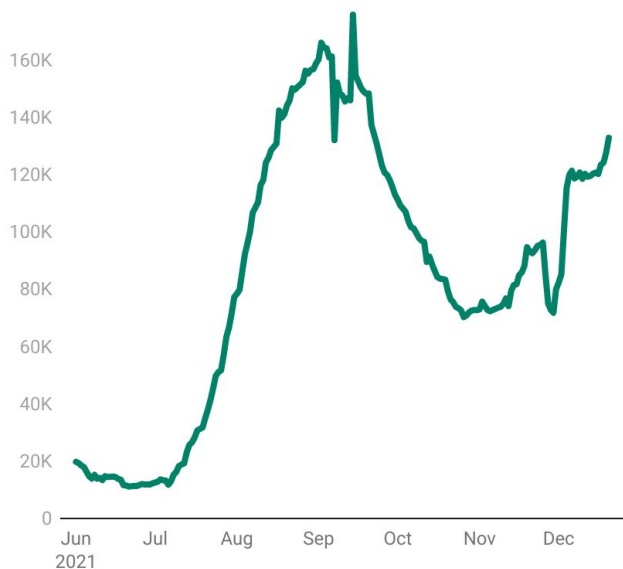
Sources: State Health Depts.—December 20, 2021 (Northern NE includes: ME, NH & VT & Southern NE includes: CT, MA & RI)

# National Data



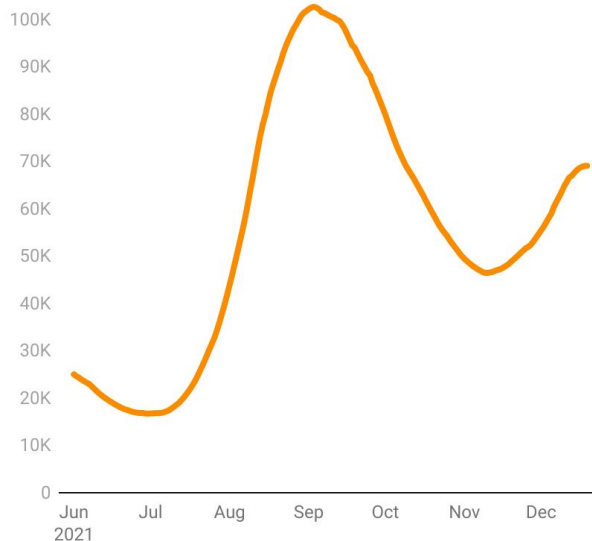
# U.S. Infections, Hospitalizations, & Deaths

**11.1% Increase**  
**Over last 7 days**



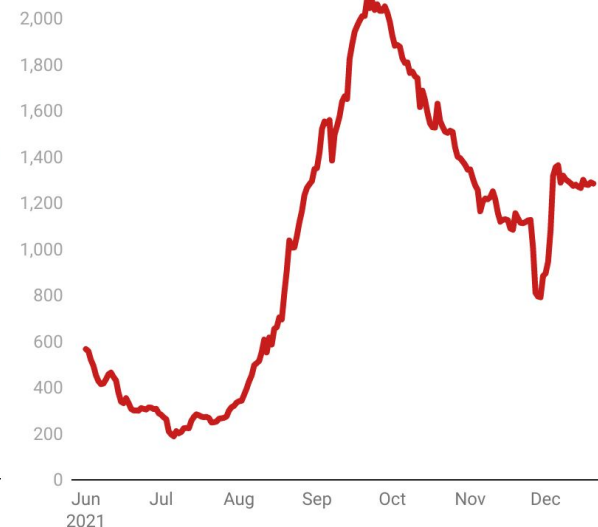
**Infections**  
**(7-Day Average)**

**3.7% Increase**  
**Over last 7 days**



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

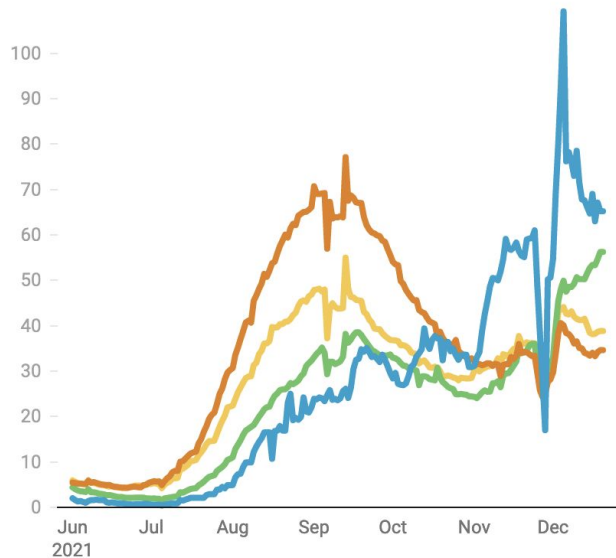
**0.4% Increase**  
**Over last 7 days**



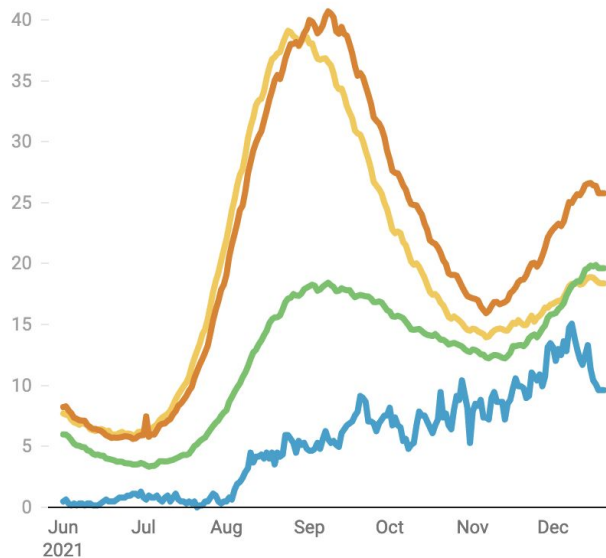
**Deaths**  
**(7-Day Average)**

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

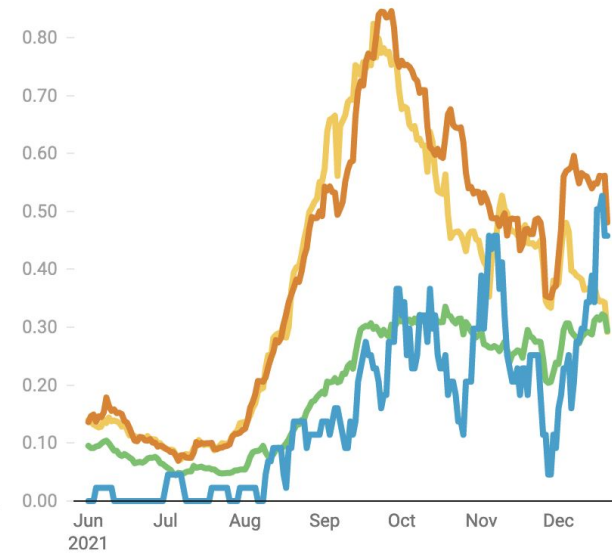
Bottom Third Vaccinated States   Middle Third Vaccinated States   Top Third Vaccinated States   Vermont



Infections per 100K



Hospitalizations per 100K  
(Current)

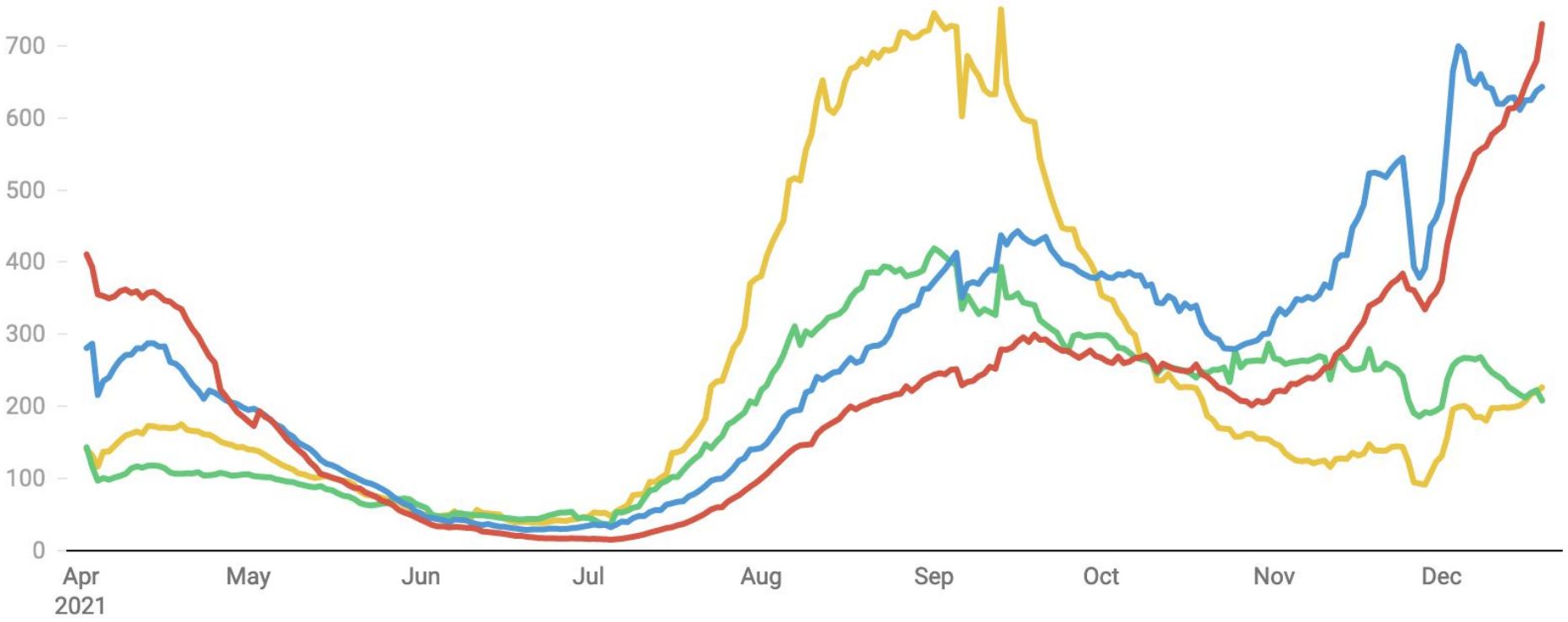


Deaths per 100K

# 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.

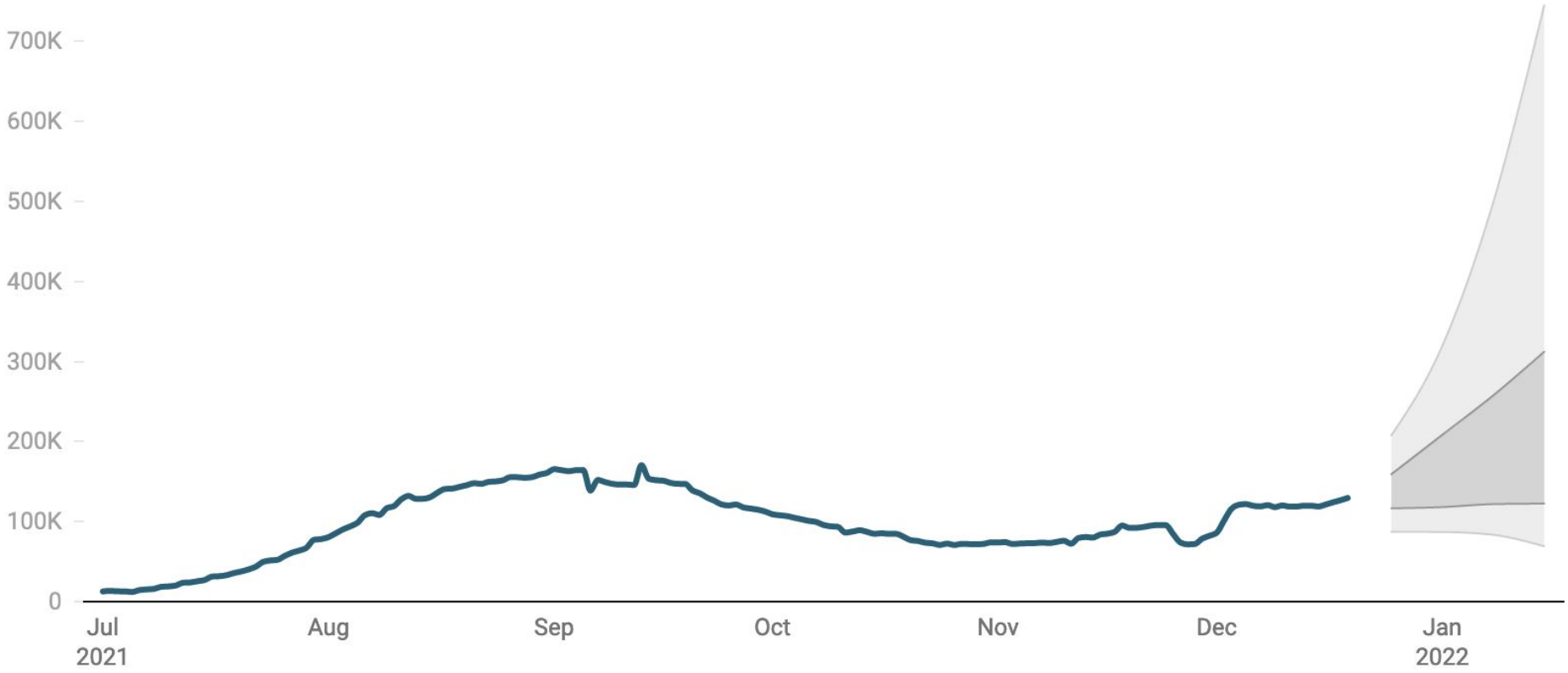
— Northeast — Midwest — South — West



Source: JHU—December 21, 2021; 7-day averages; created with Datawrapper

# US COVID-19 Infection Confidence Intervals

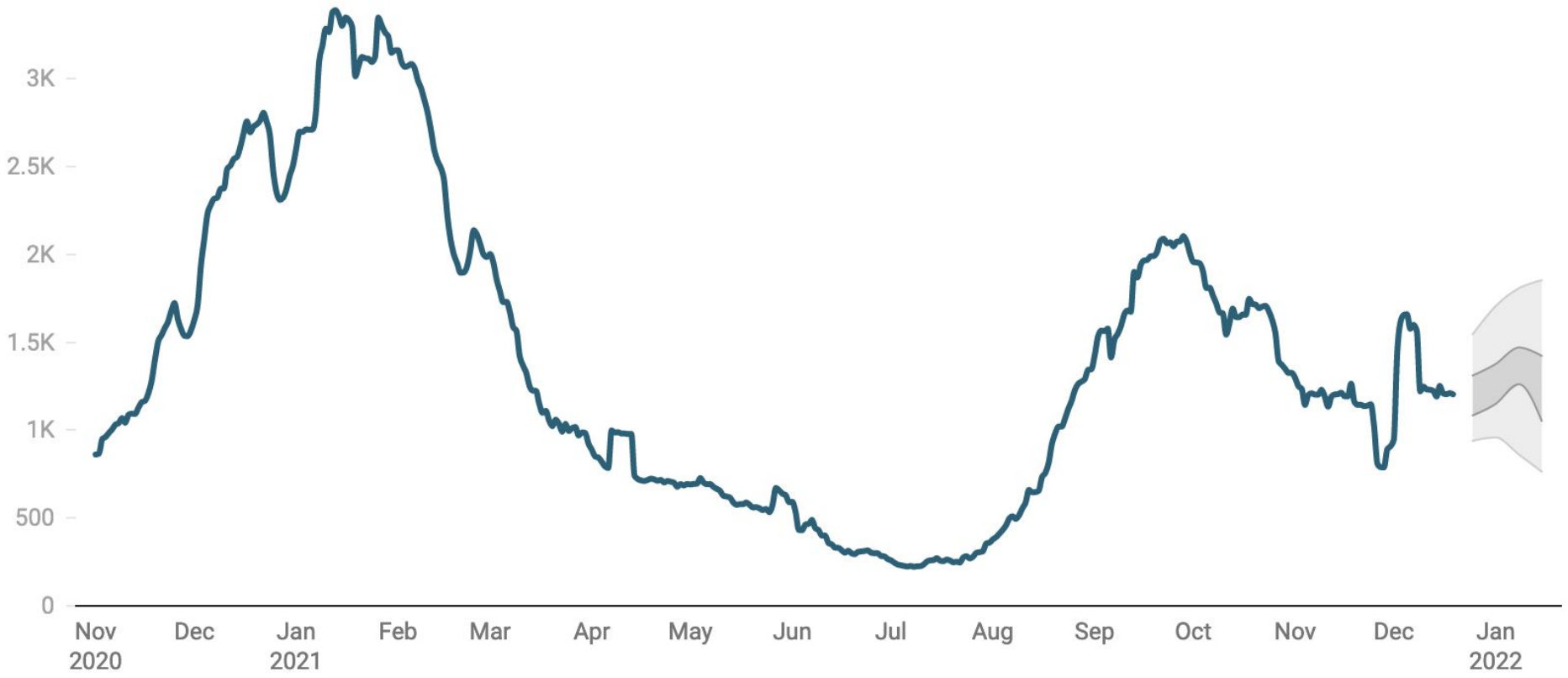
Calculated as a 7-day mean. Inner and outer bands represent 50% and 95% confidence intervals, respectively.



Source: CDC—December 21, 2021; created with Datawrapper

# US COVID-19 Death Confidence Intervals

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



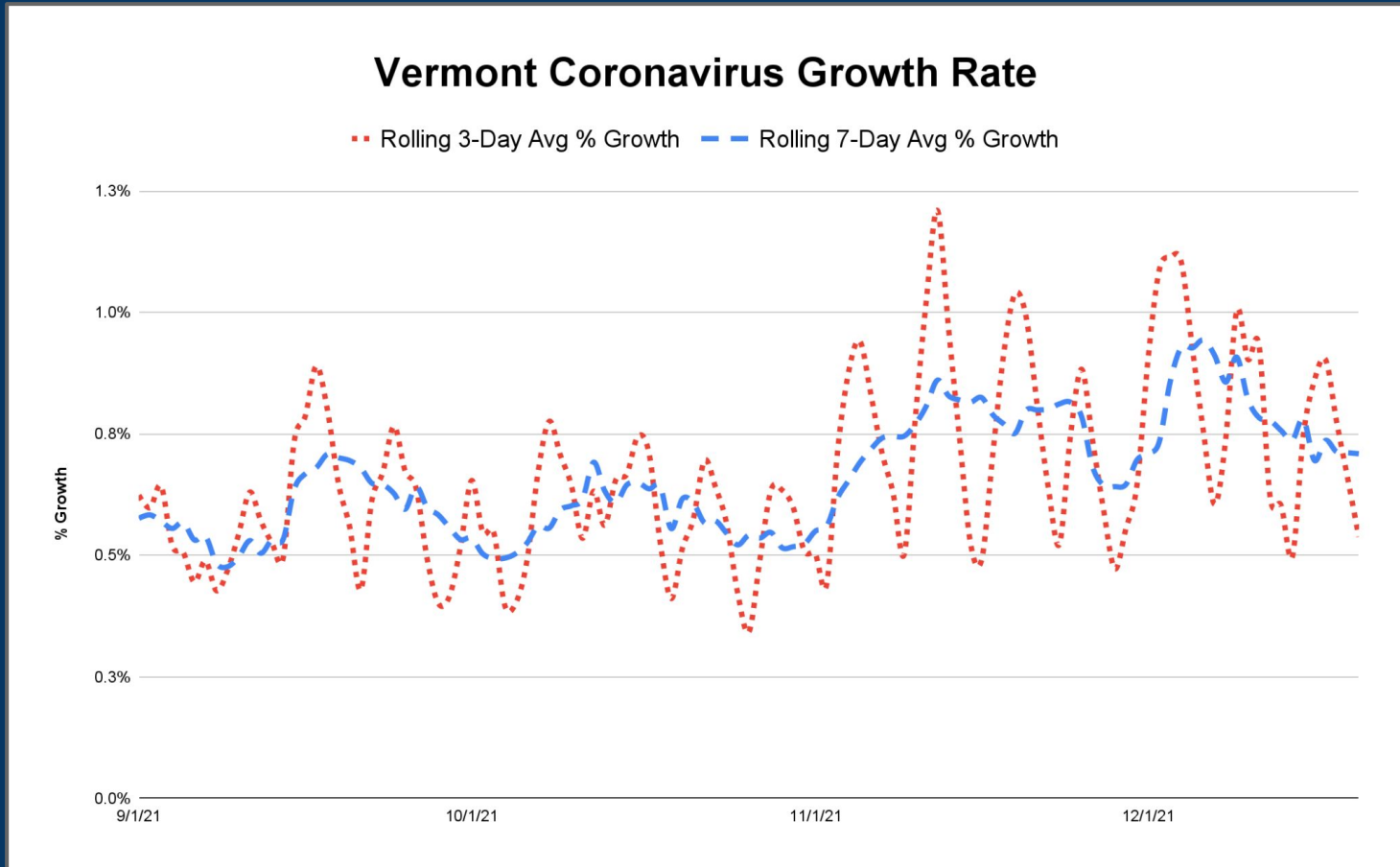
Source: CDC—December 21, 2021; created with Datawrapperr

# RESTART VERMONT

## Reopening Metrics

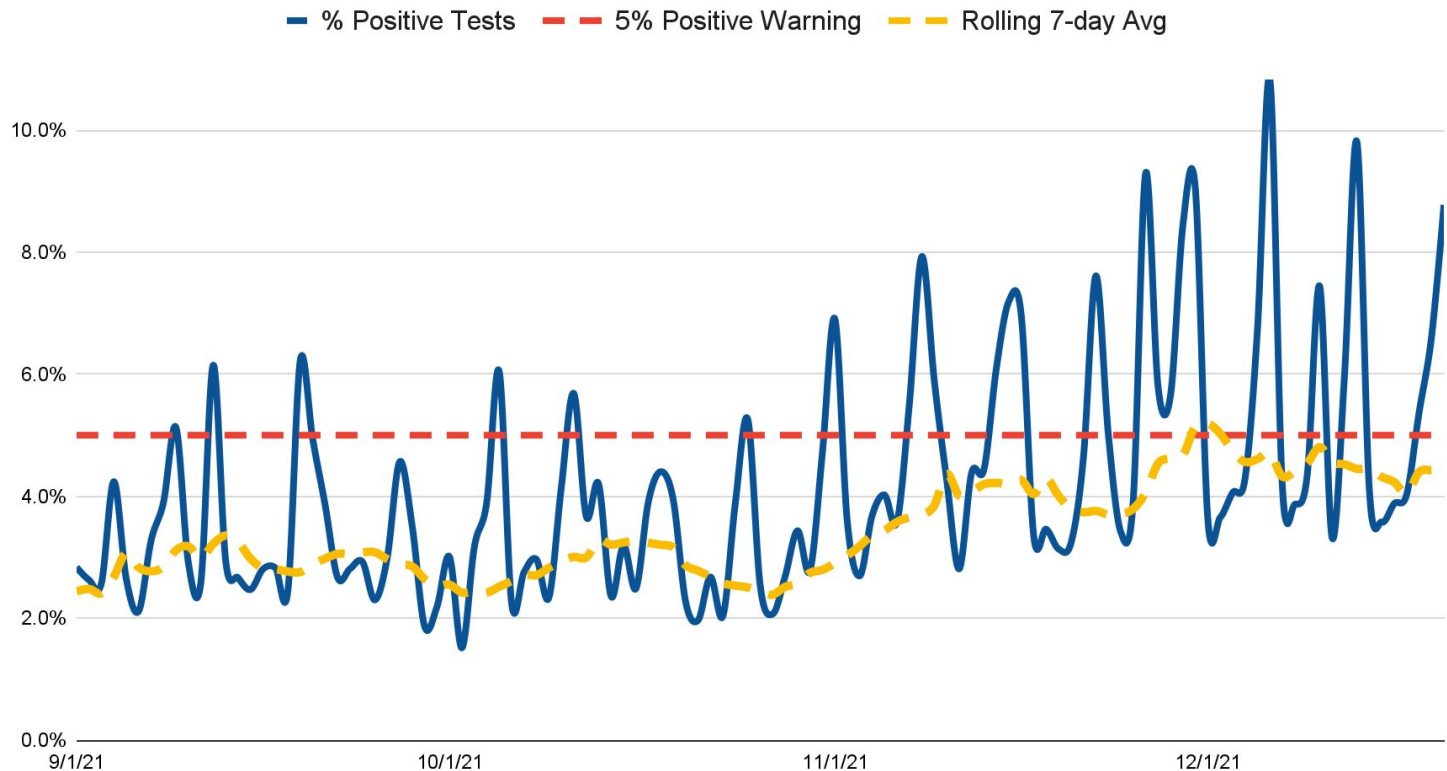
1. Syndromic Surveillance (*retired*)
2. Viral Growth & Reproductive Rates
3. Percentage of New Positive Tests
4. Hospital & Critical Care Bed Capacity
5. Testing Volume

# Viral Growth & Reproductive Rates



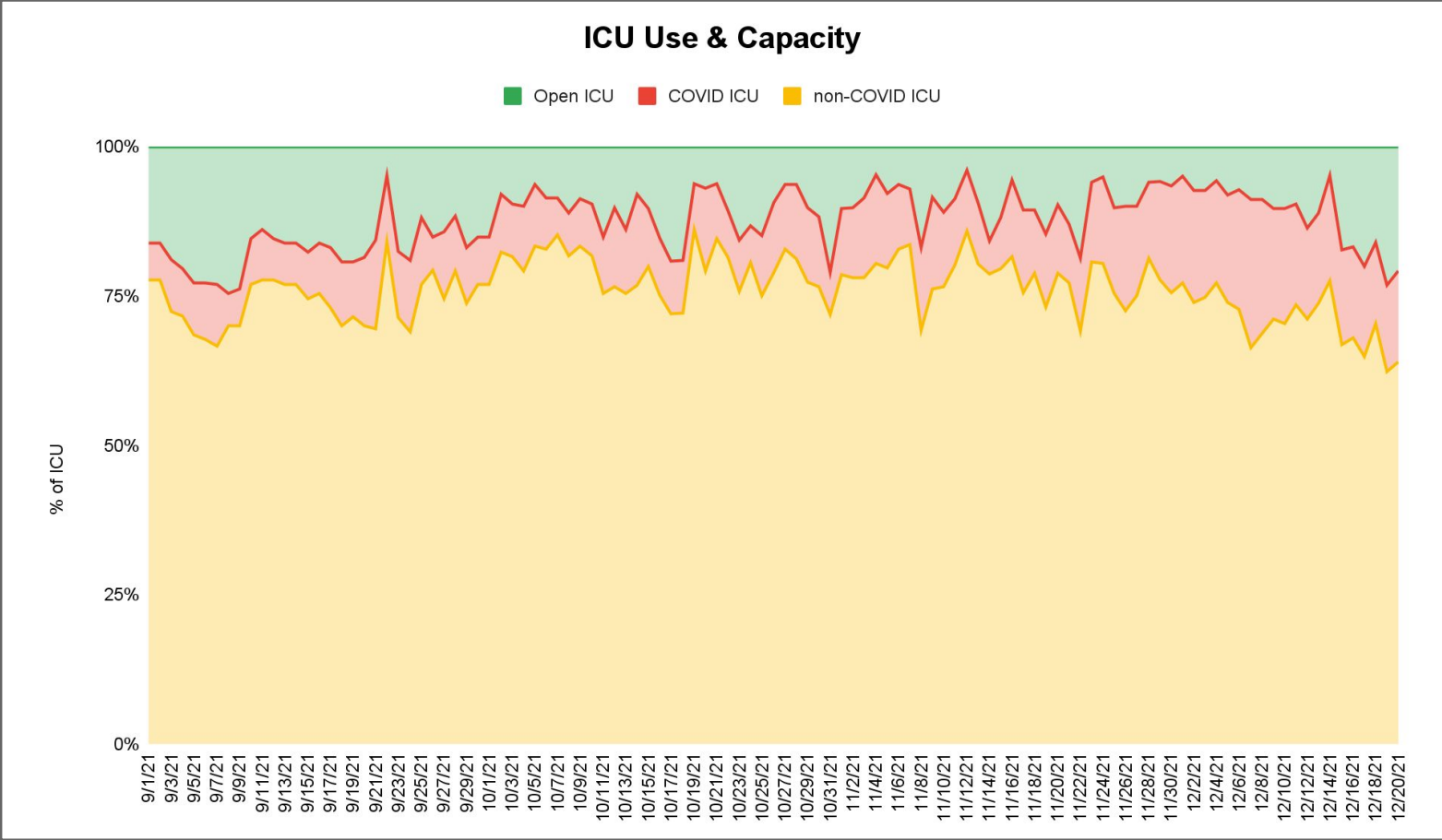
# Test Positivity

## Percent Tests Yielding New Positive COVID-19 Cases





# Hospital & Critical Care Beds



Source: Vermont Department of Health

# Vermont Testing

