

COVID-19 Modeling

November 24, 2020

Presentation available at:
dfr.vermont.gov

12 Million+ U.S. Cases

November 24, 2020

1 Million Cases *99 Days*

2 Million Cases *43 Days*

3 Million Cases *28 Days*

4 Million Cases *15 Days*

5 Million Cases *17 Days*

6 Million Cases *23 Days*

7 Million Cases *27 Days*

8 Million Cases *20 Days*

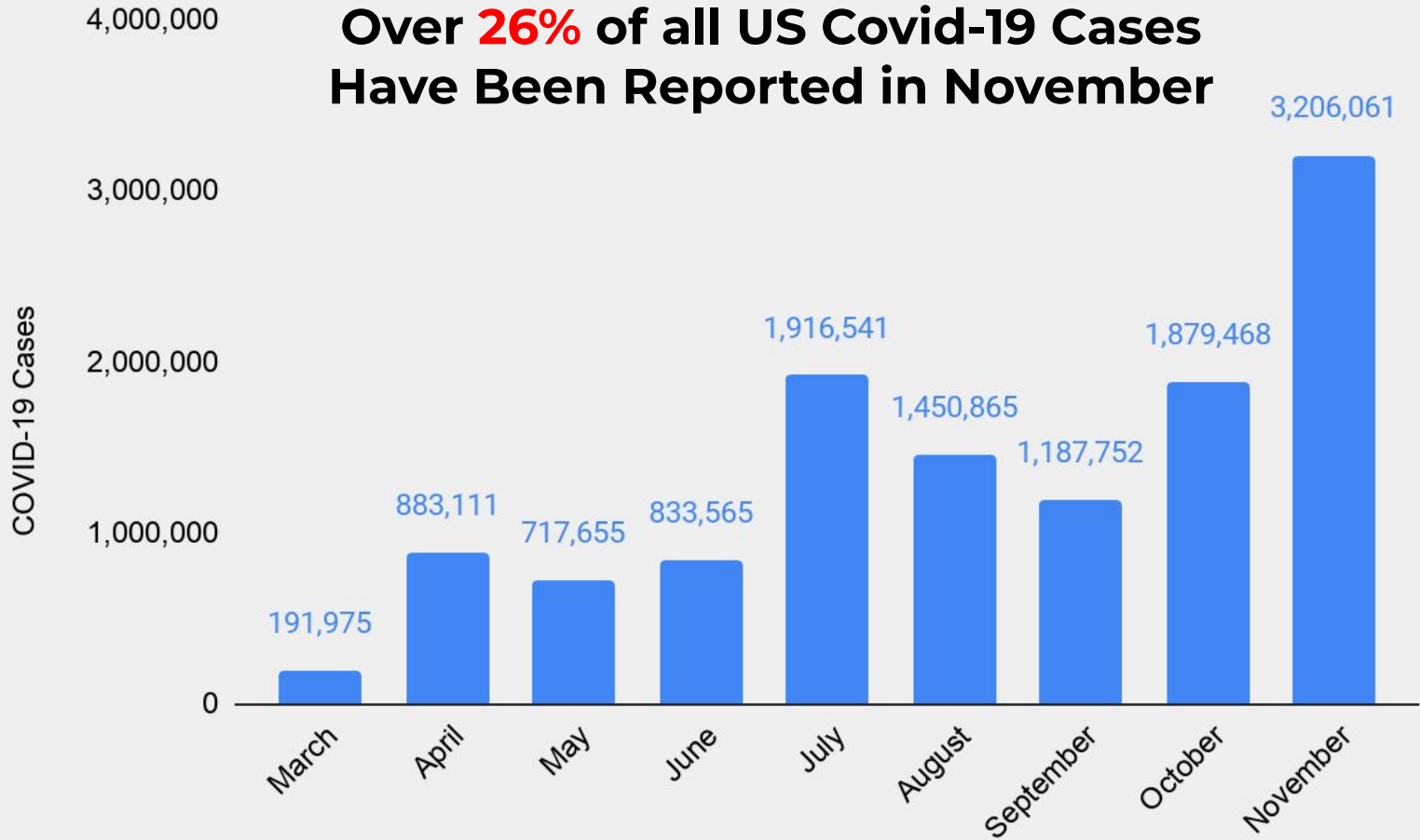
9 Million Cases *13 Days*

10 Million Cases *10 Days*

11 Million Cases *6 Days*

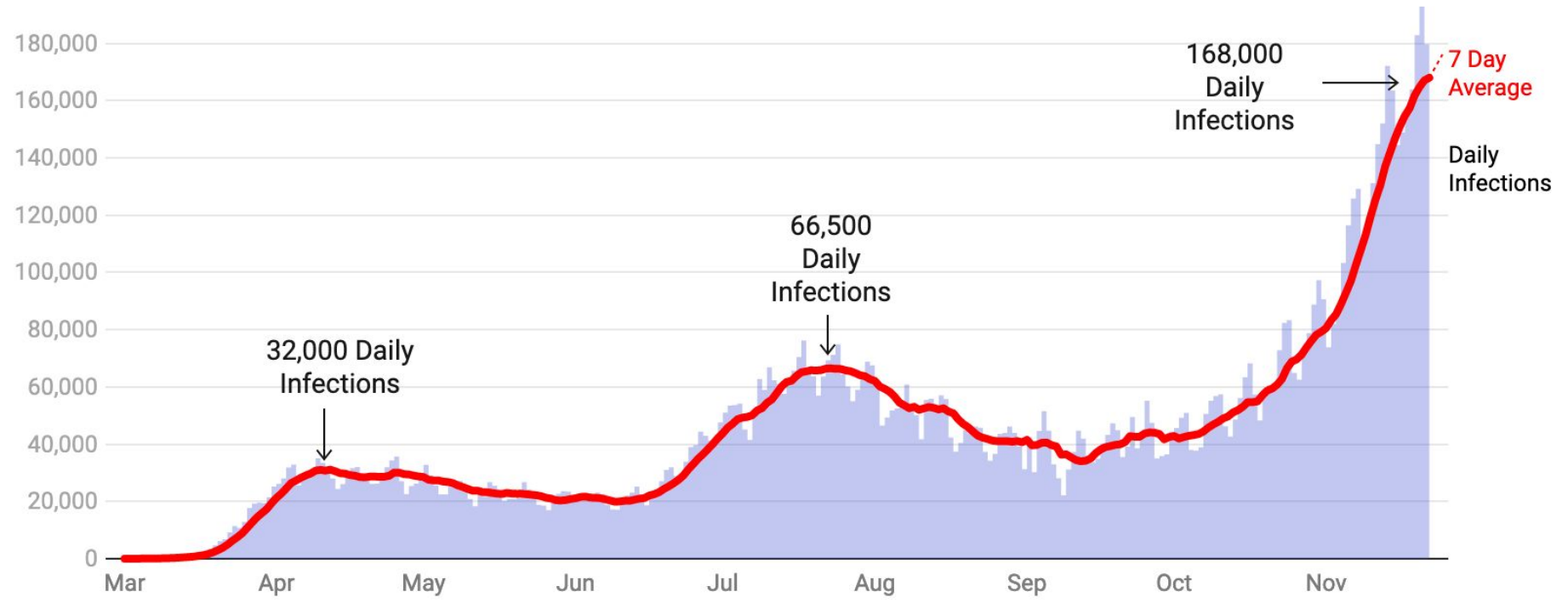
12 Million Cases *6 Days*

Over **26%** of all US Covid-19 Cases Have Been Reported in November

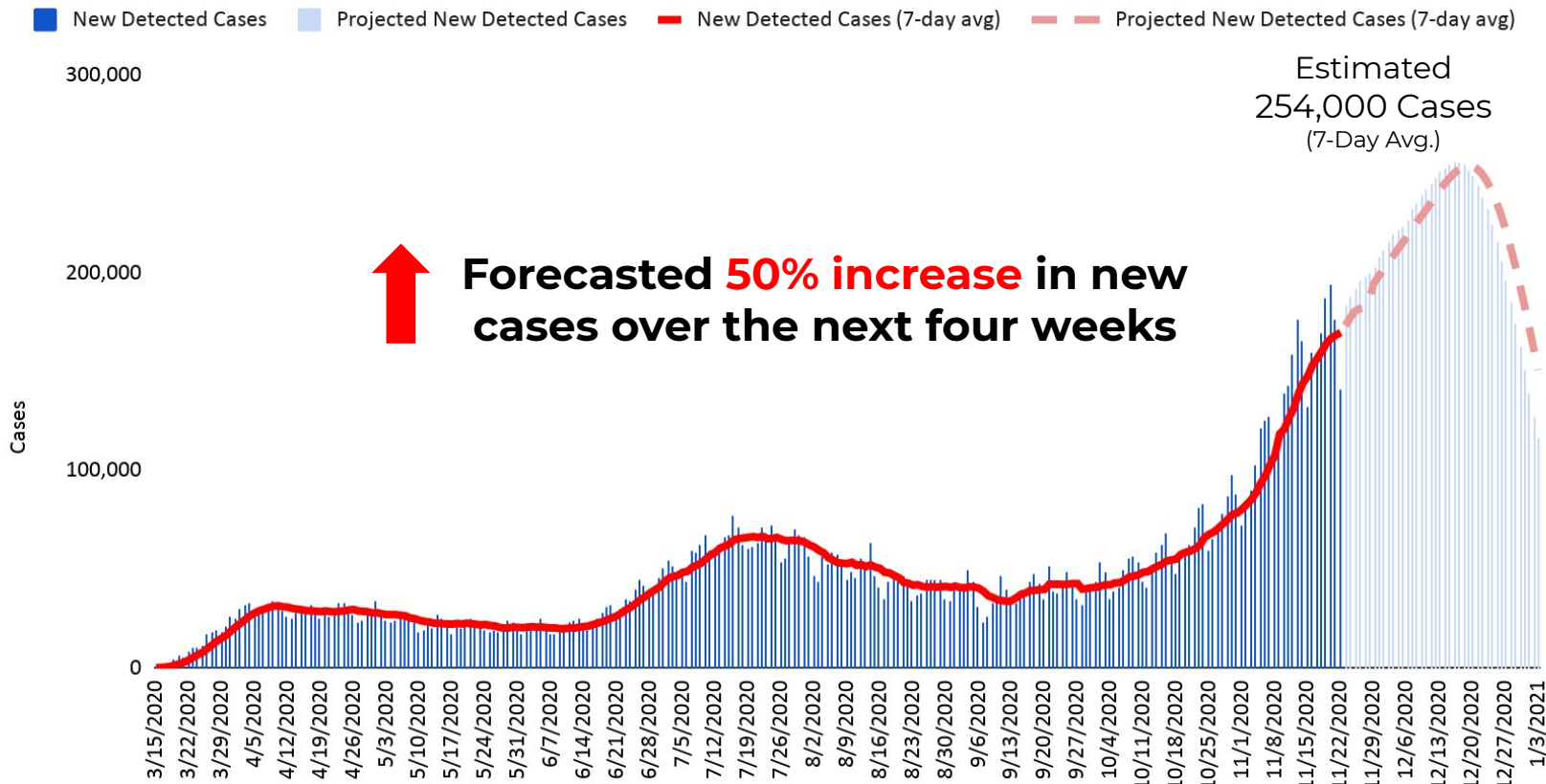


U.S. Case Growth

US Covid-19 Cases



National Forecast



COVID-19 & Holidays

Memorial Day

Fourth of July

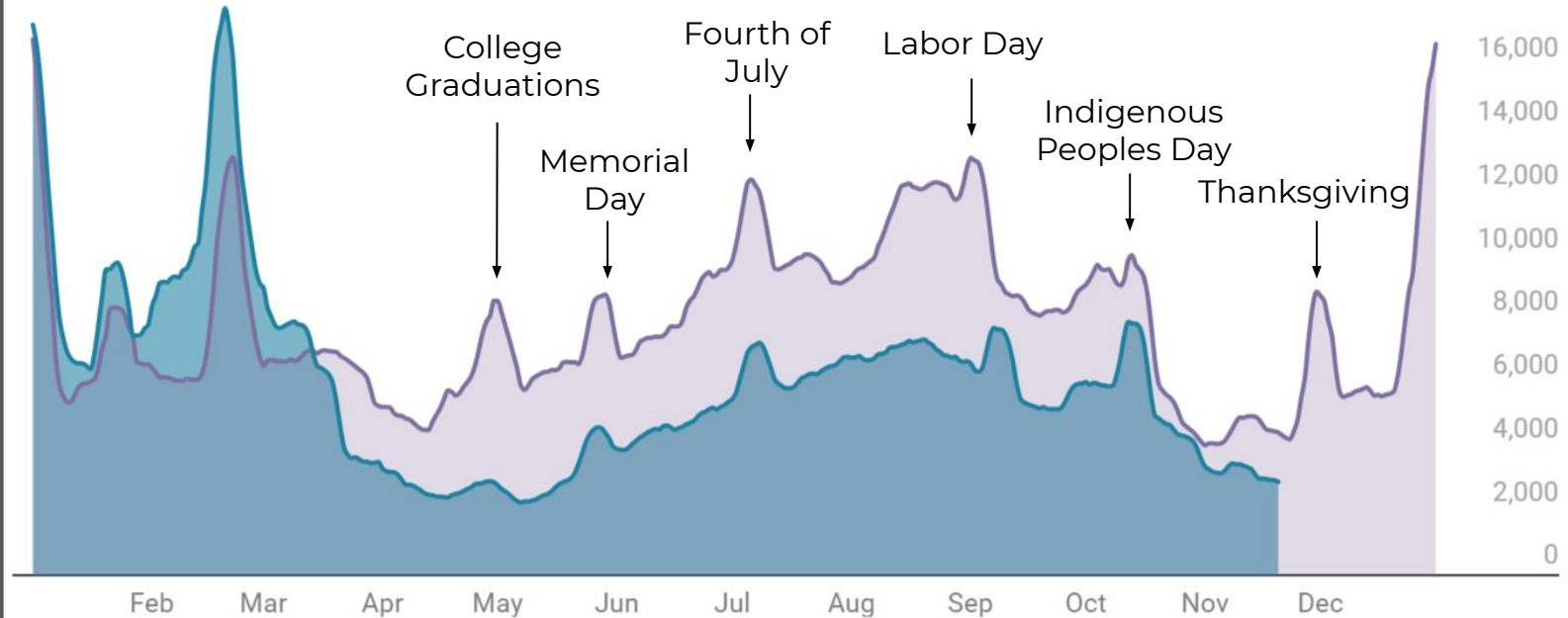
Labor Day

Halloween

Thanksgiving

Out-of-State Visitors to Vermont 2019 vs 2020

Estimate of visitors uses 7-day average # mobile devices from out of state.

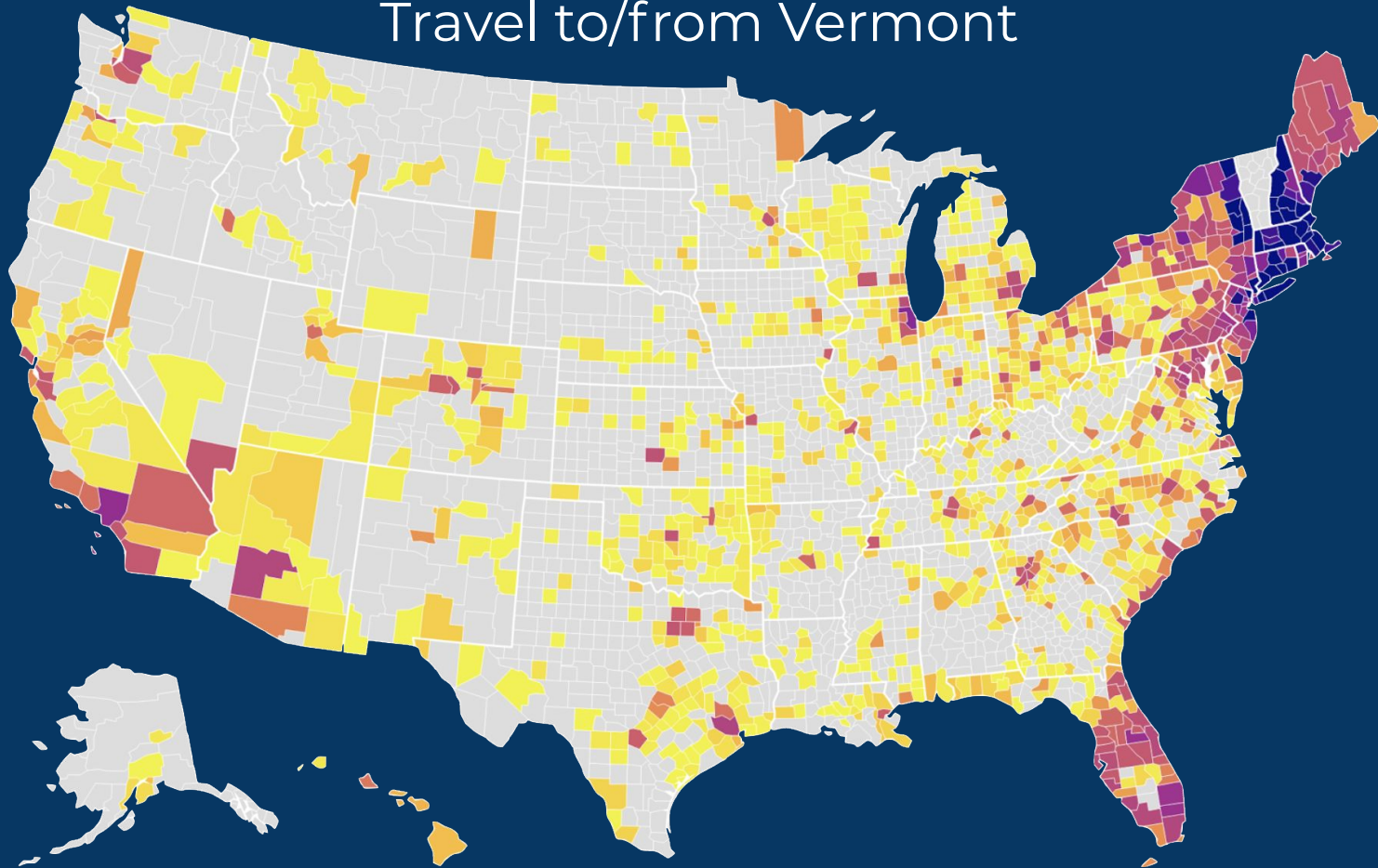


11/23/2020

Chart: State of Vermont • Source: Safegraph • Created with [Datawrapper](#)

Thanksgiving Weekend 2019

Travel to/from Vermont



Source: SafeGraph (Travel measured from Wednesday, November 27, 2019 to Sunday December 1, 2019)

Thanksgiving 2020

Three Key Assumptions

How many people are coming to Thanksgiving infected with COVID-19?

- Level of active cases in the community
- Level of active cases where guests are visiting
- Number of guests at Thanksgiving

How many additional people will be infected during Thanksgiving?

- Length of time guests will visit unmasked
- Amount of space in home and dining area
- Average ventilation in personal residence

Number and size of Thanksgiving dinners in Vermont?

- Census data on number of Vermont households
- Research on the average Thanksgiving dinner size
- Surveys on 2020 Thanksgiving plans

Thanksgiving 2020

If Vermonters travel and gather for Thanksgiving consistent with the Ohio State University Medical Center national survey, then

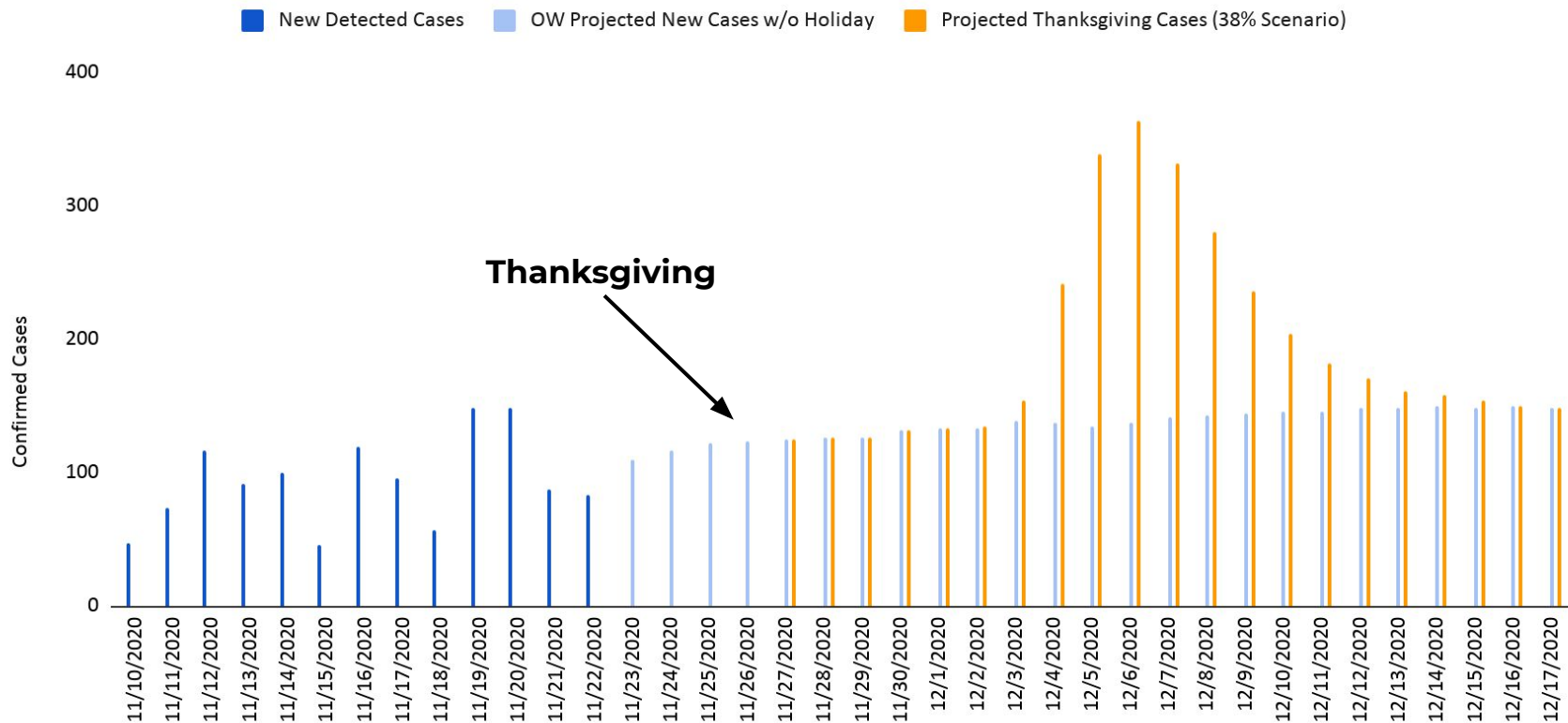
In the days following Thanksgiving we could see an additional:

~3,200 to ~3,800 new infections (detected and undetected)

~40 to ~50 resulting new hospitalizations

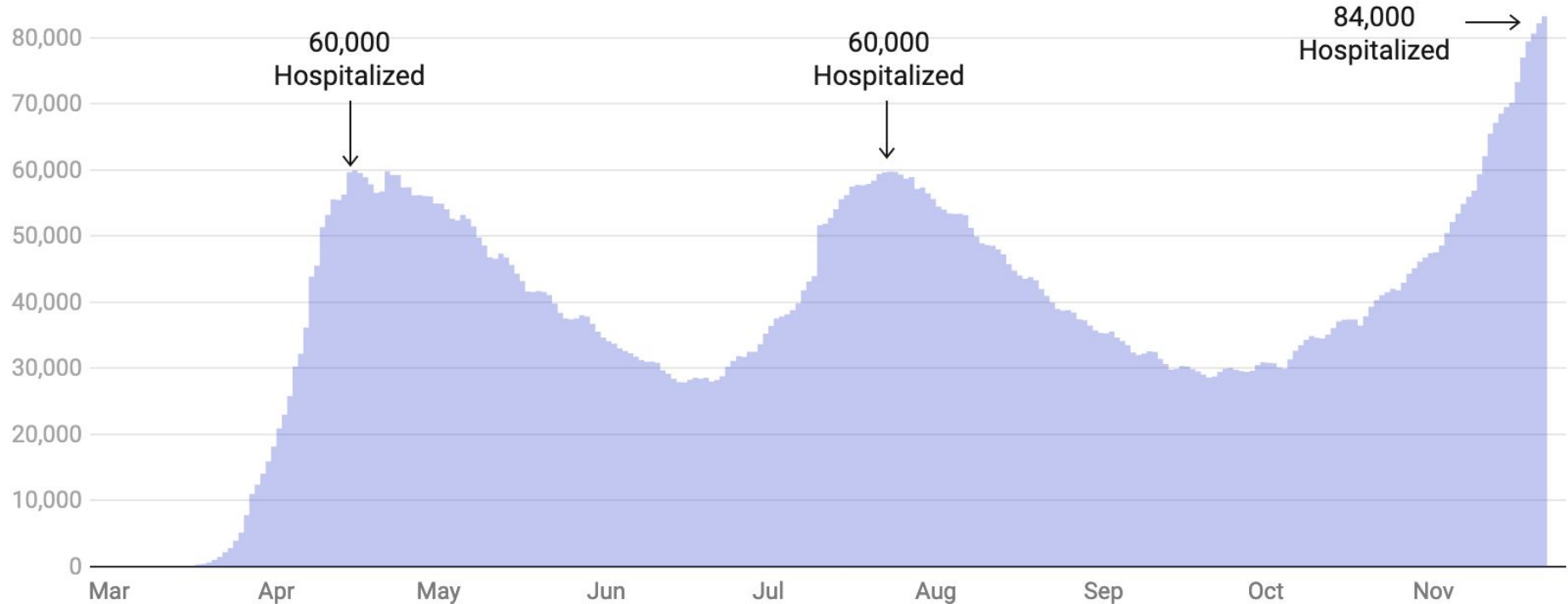
These estimates are accounting solely for the Thanksgiving holiday and are in addition to the cases that will occur otherwise during this time.

Vermont Thanksgiving Possible Amplification



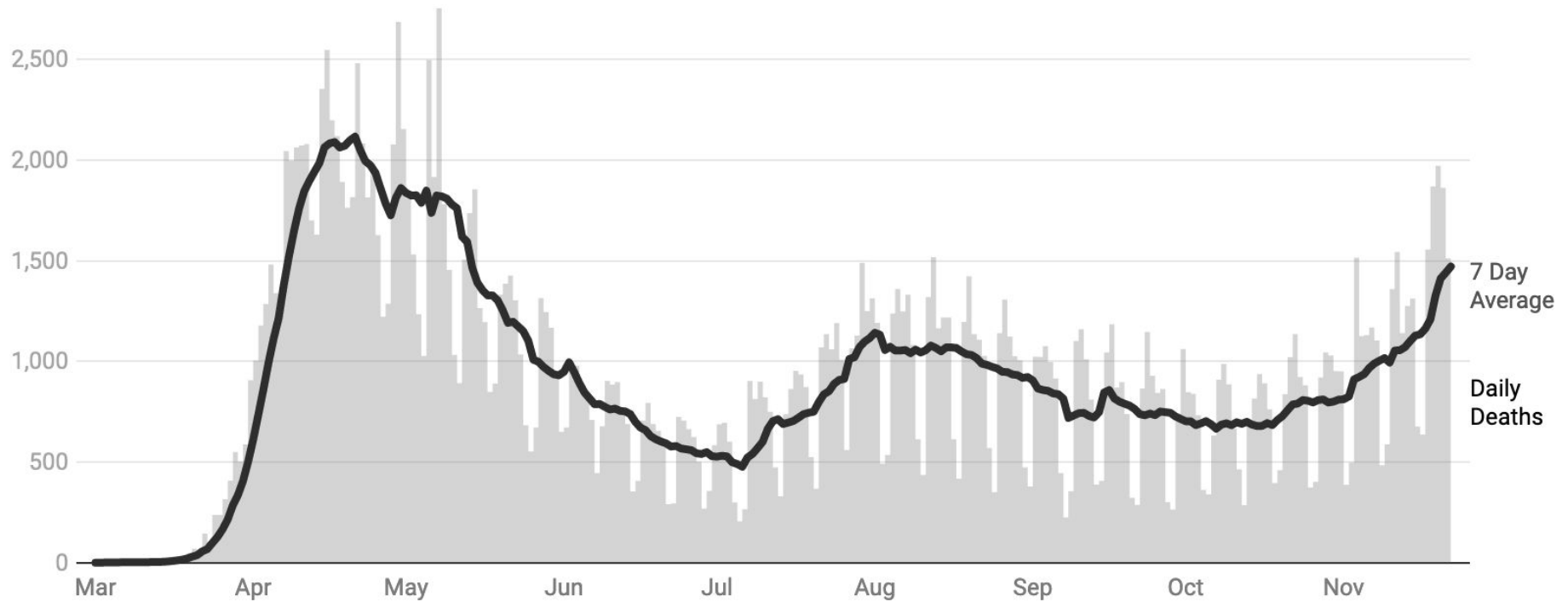
U.S. Hospitalization Growth

Individuals Hospitalized with Covid-19 in US



U.S. Covid-19 Deaths

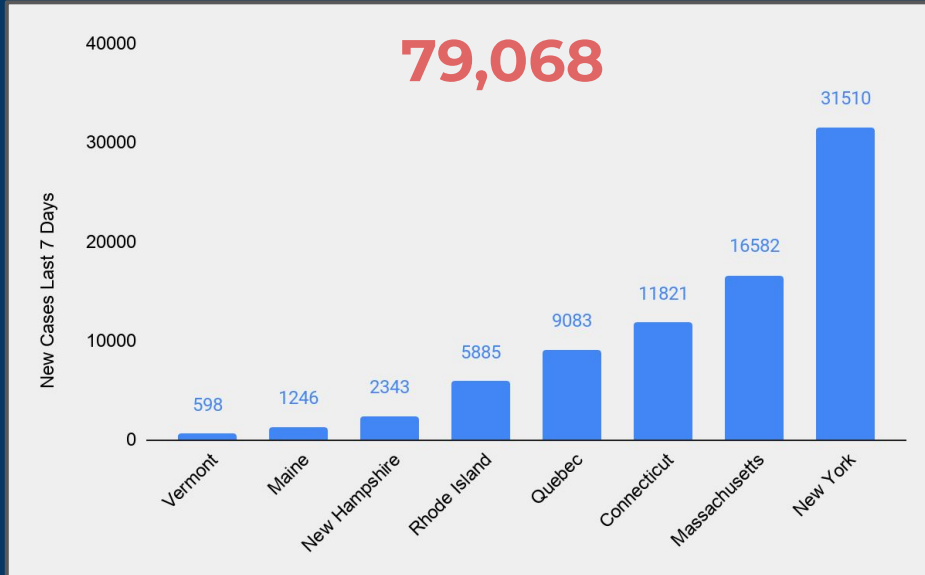
Individuals Hospitalized with Covid-19 in US



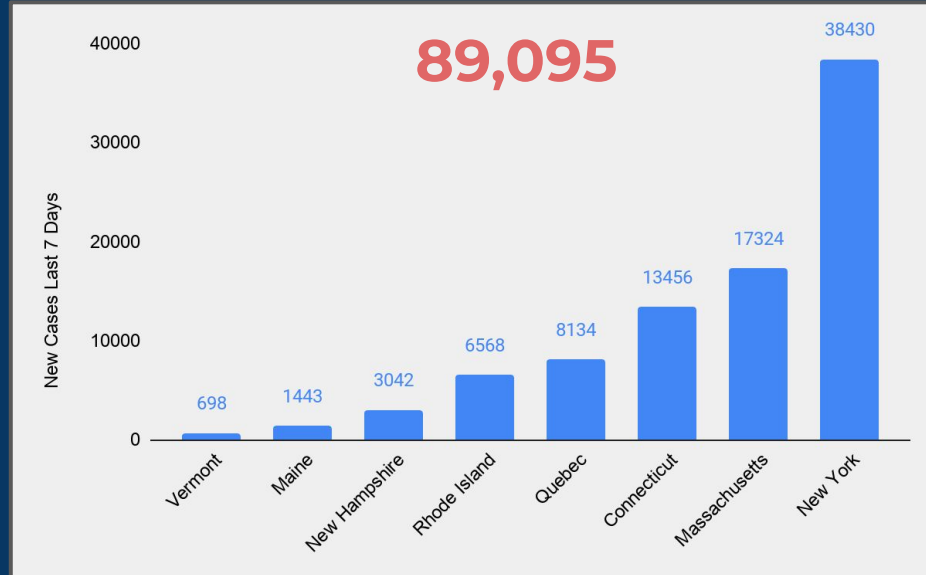
Regional Case Growth

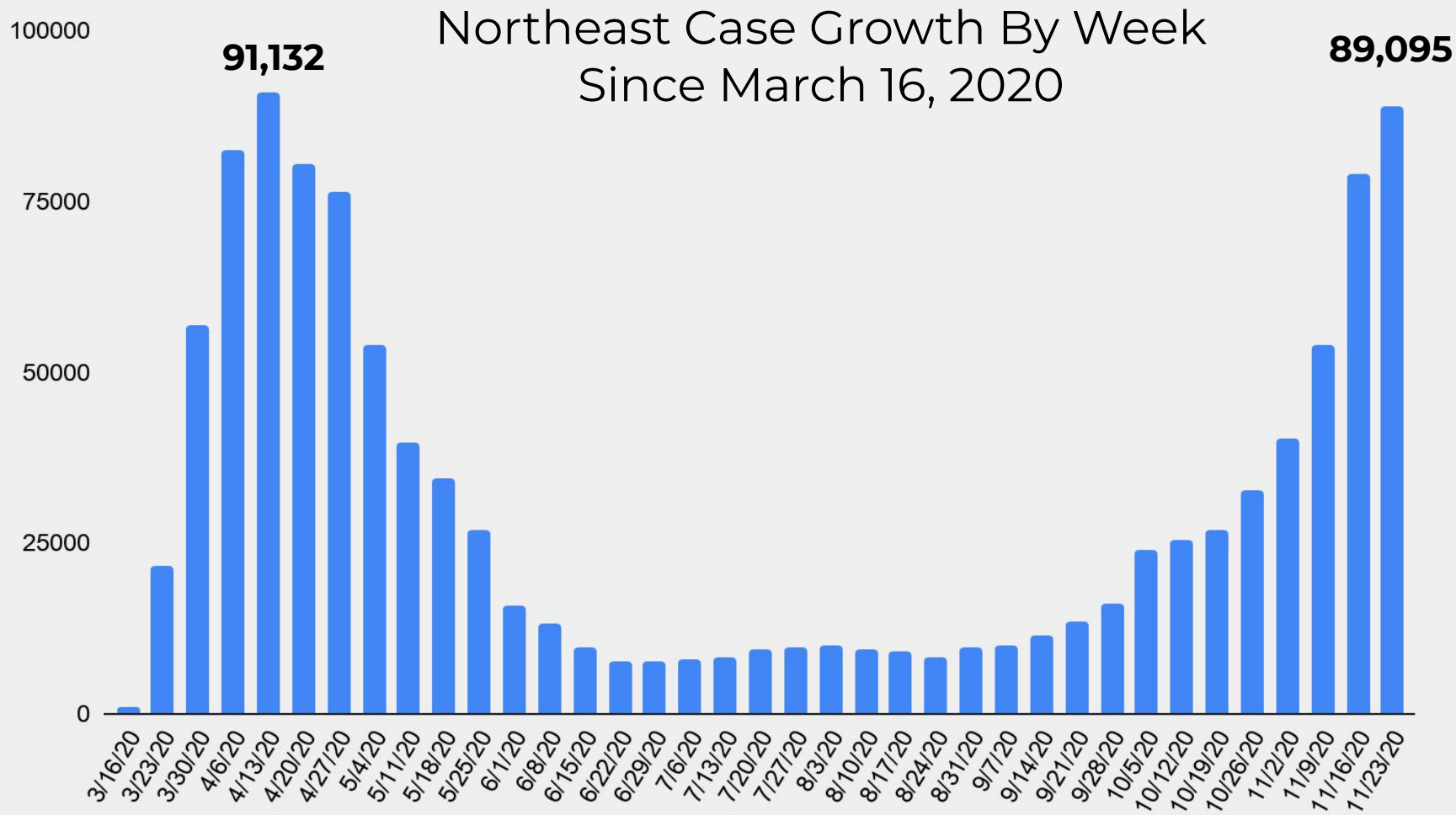
12.68% Increase in New Confirmed Cases

Positive Cases Nov. 10th to Nov. 16th

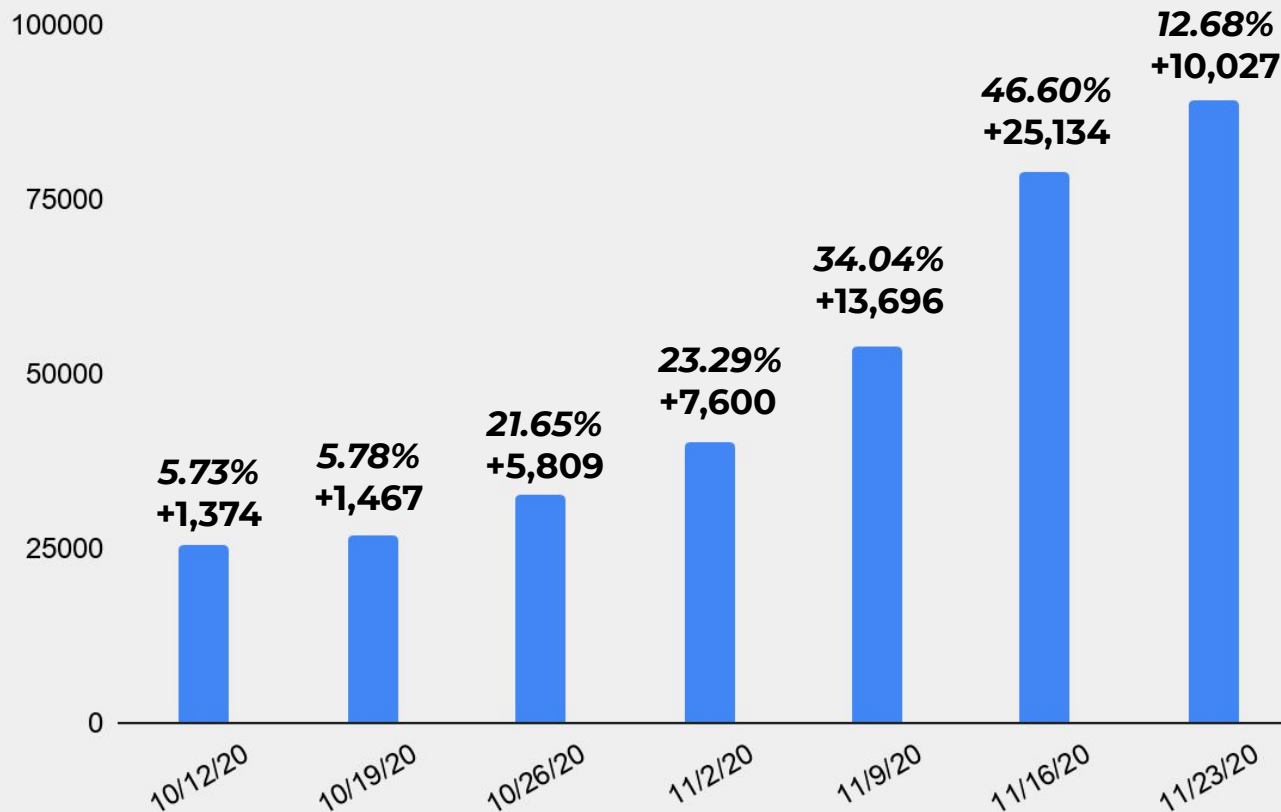


Positive Cases Nov. 17th to Nov. 23rd

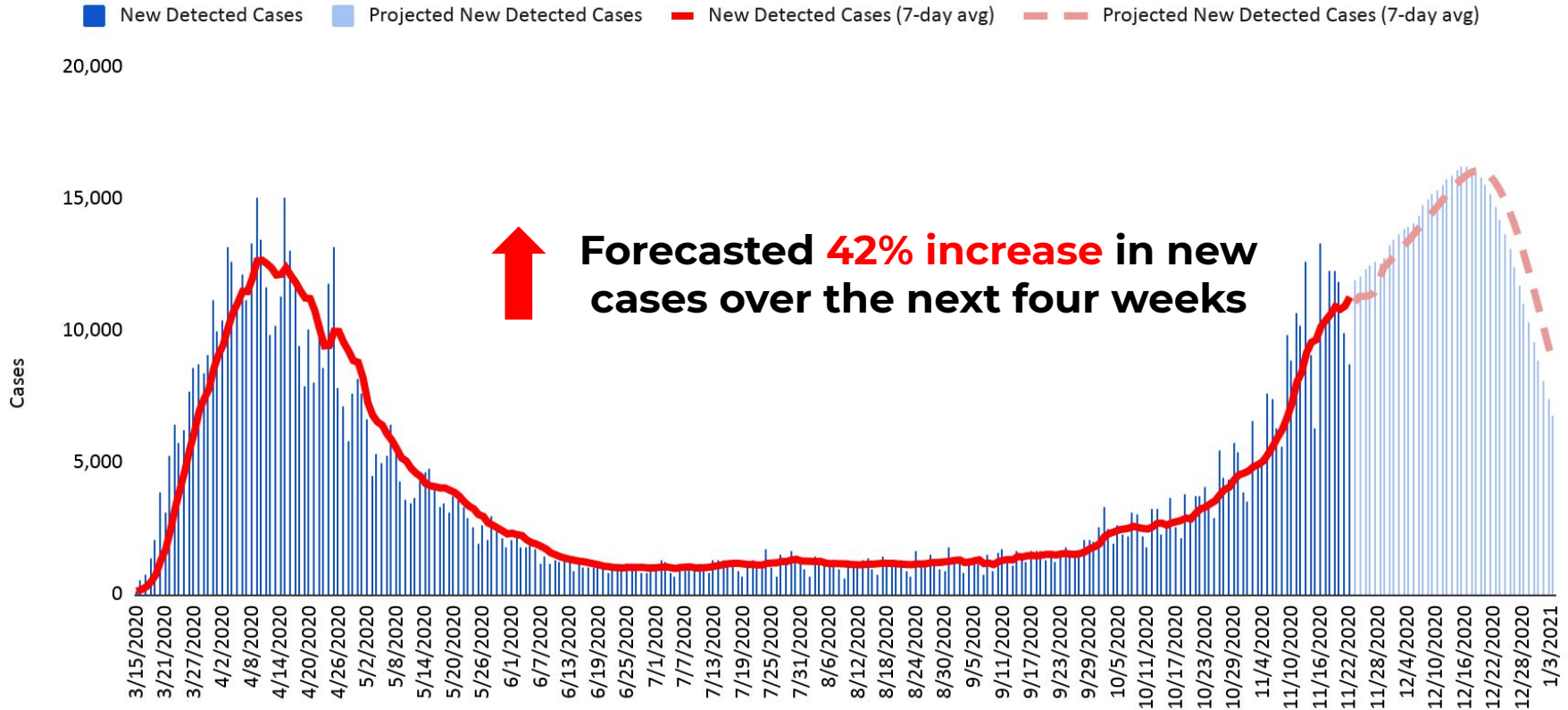




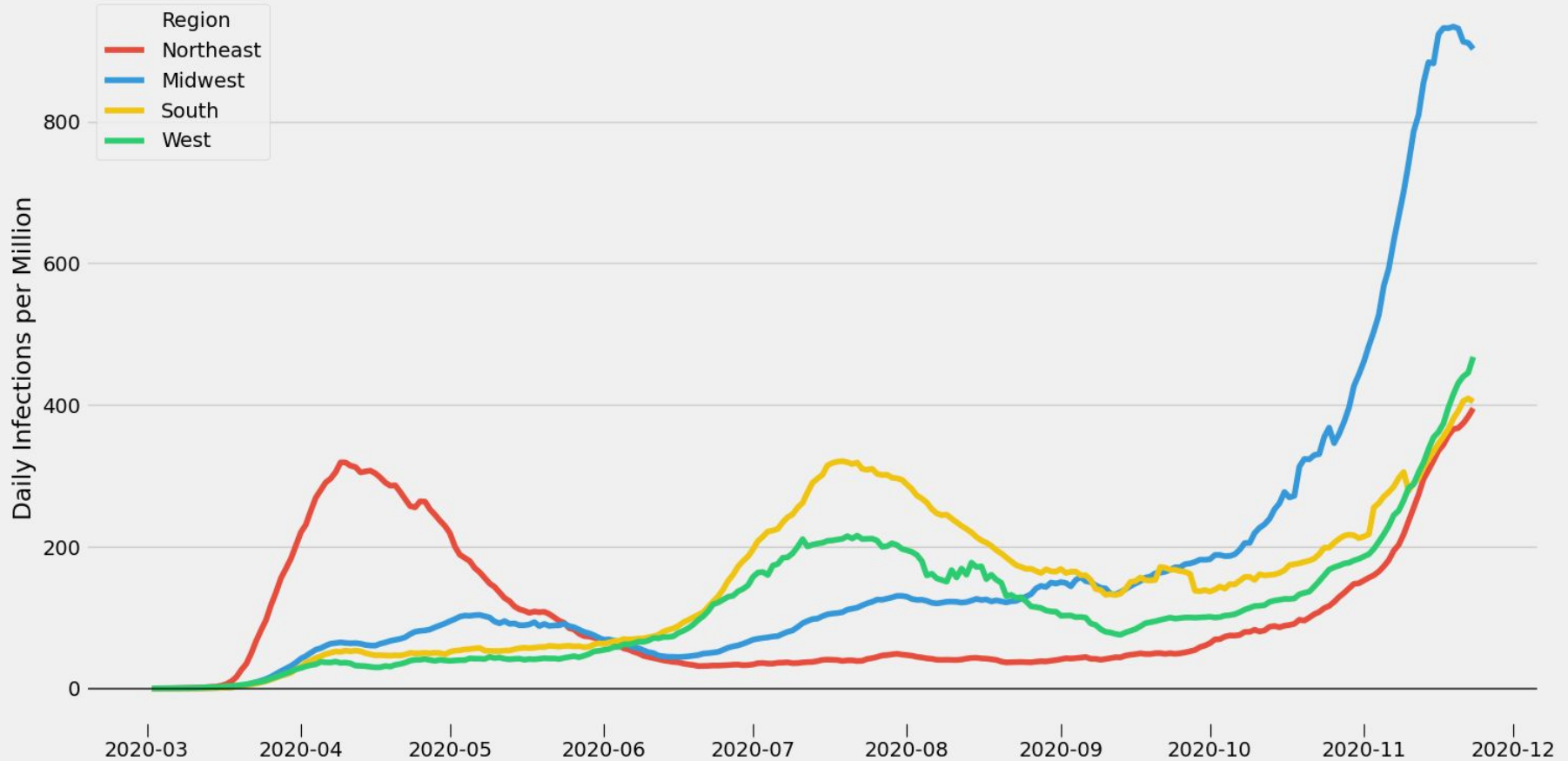
Northeast Case Growth By Week Since October 12, 2020



Northeast Forecast

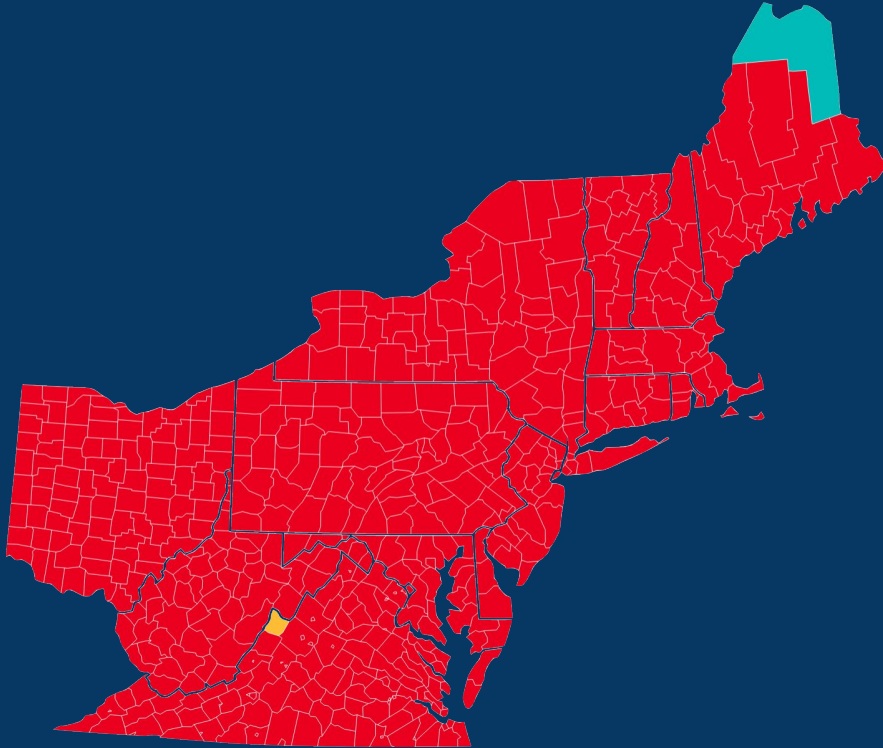


COVID-19 Daily Infections per Million by Census Region (7-Day Moving Average)

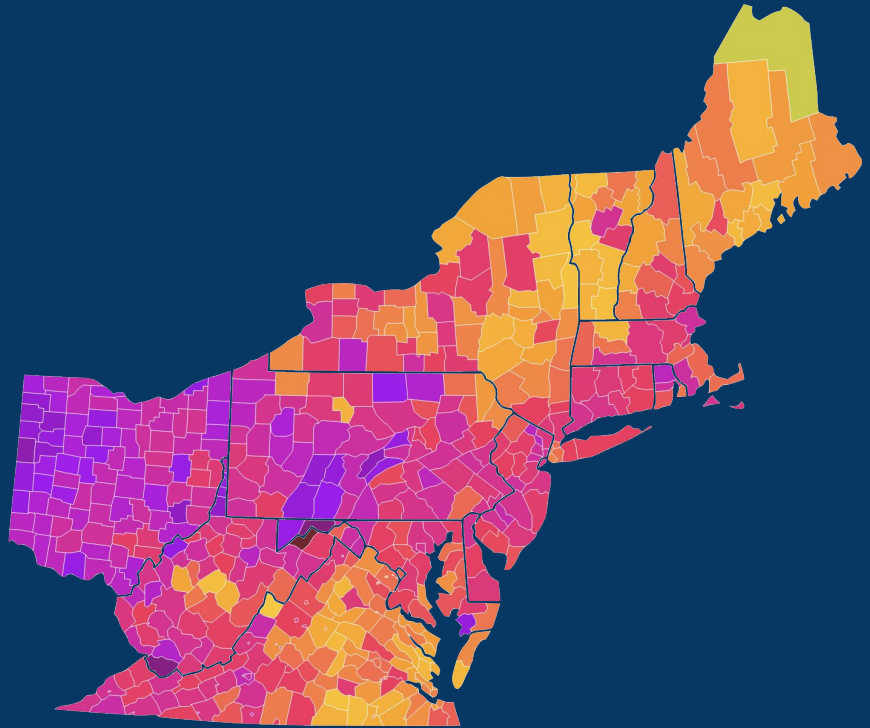


Updated Regional Map

**Travel Map
as of November 23**



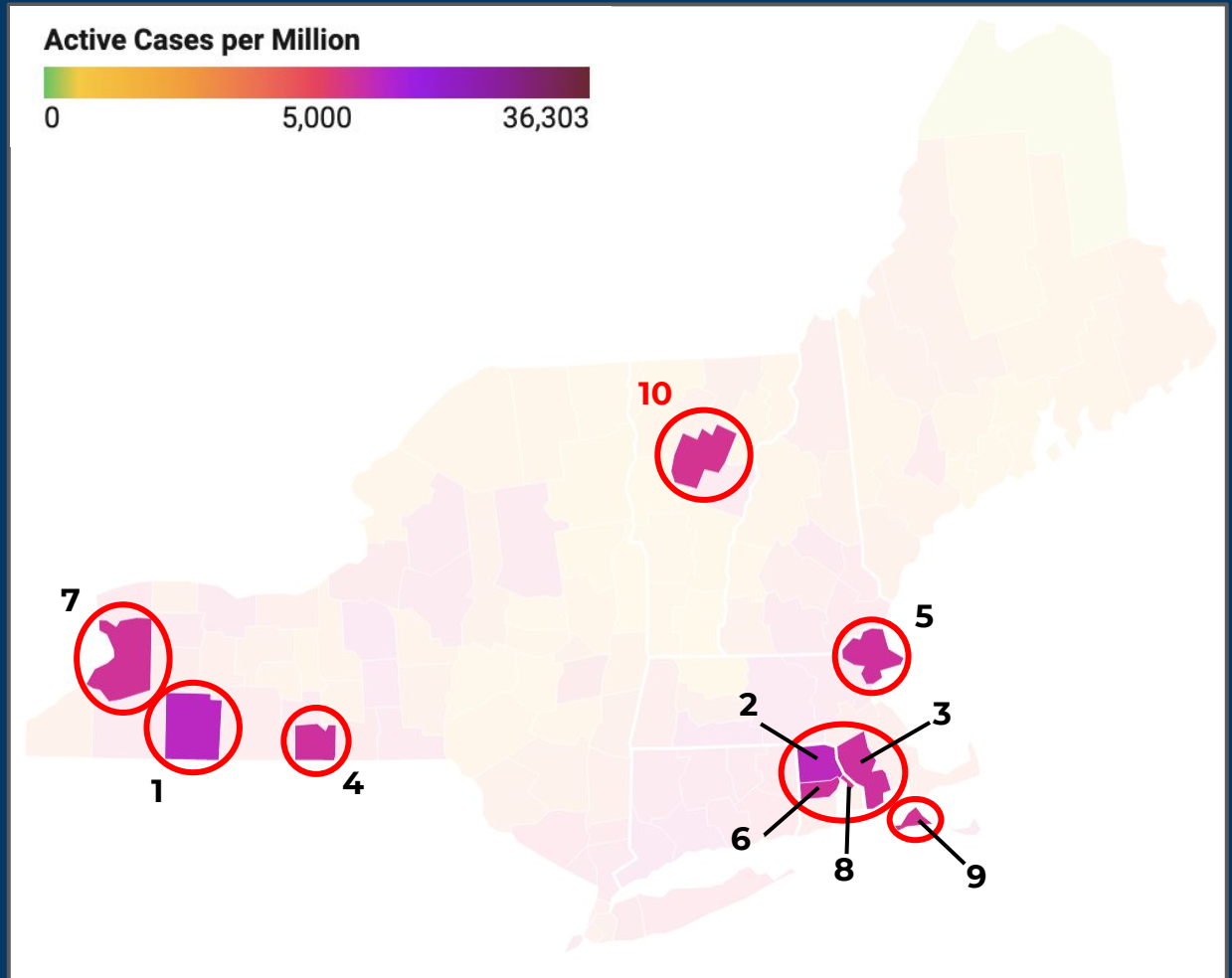
**Regional Heat Map
as of November 23**



Regional Map as of November 23

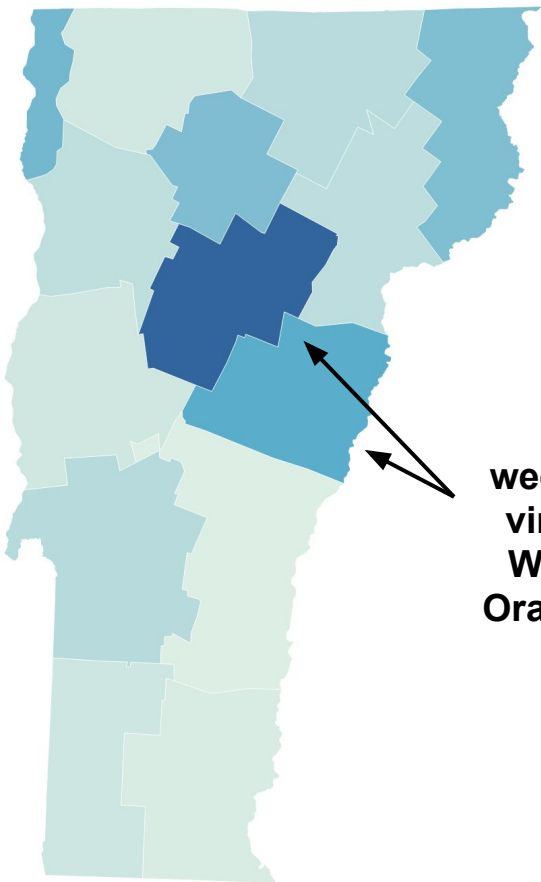
New York & New England Ranking
by Active Case Per Million

- 1) **Allegany (NY): 12,280**
- 2) **Providence (RI): 12,004**
- 3) **Bristol (MA): 9,678**
- 4) **Chemung (NY): 9,632**
- 5) **Essex (MA): 9,580**
- 6) **Kent (RI): 9,557**
- 7) **Erie (NY): 9,238**
- 8) **Bristol (RI): 8,850**
- 9) **Dukes (MA): 8,833**
- 10) **Washington (VT): 8,777**



Vermont Weekly Cases by County (per 100,000)

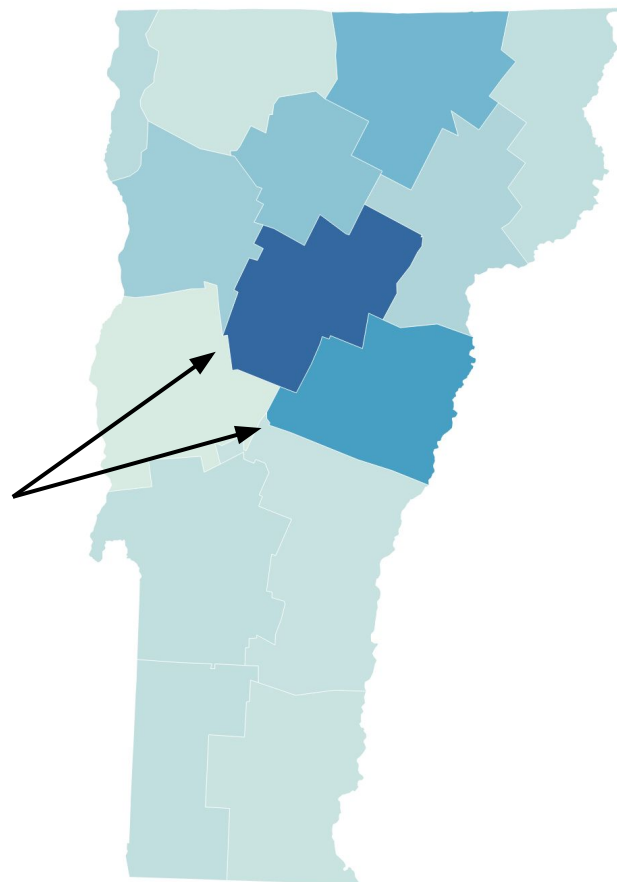
Results Reported November 10 to 16



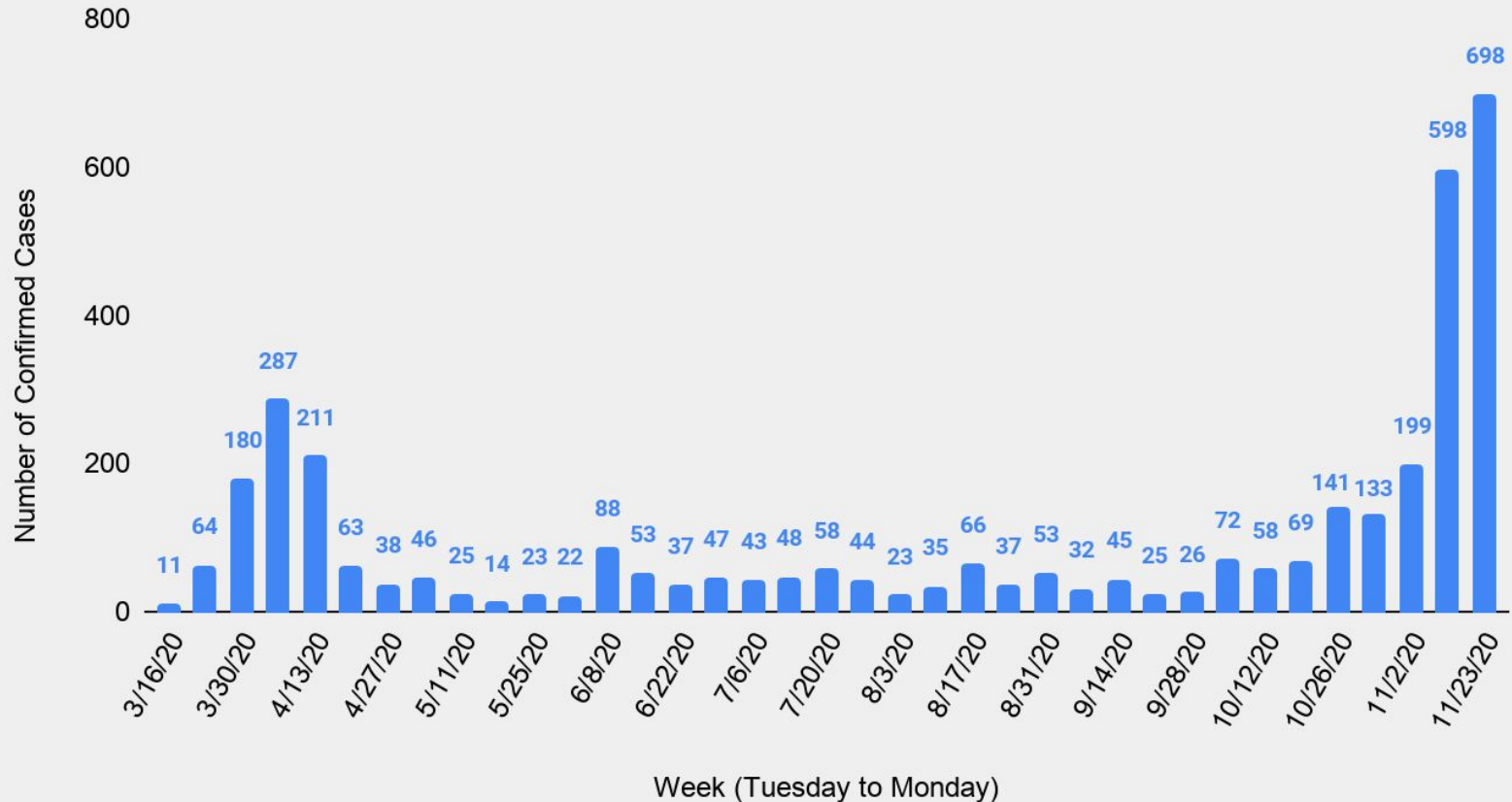
**Sustained
week-over-week
viral growth in
Washington &
Orange Counties**

Vermont Weekly Cases by County (per 100,000)

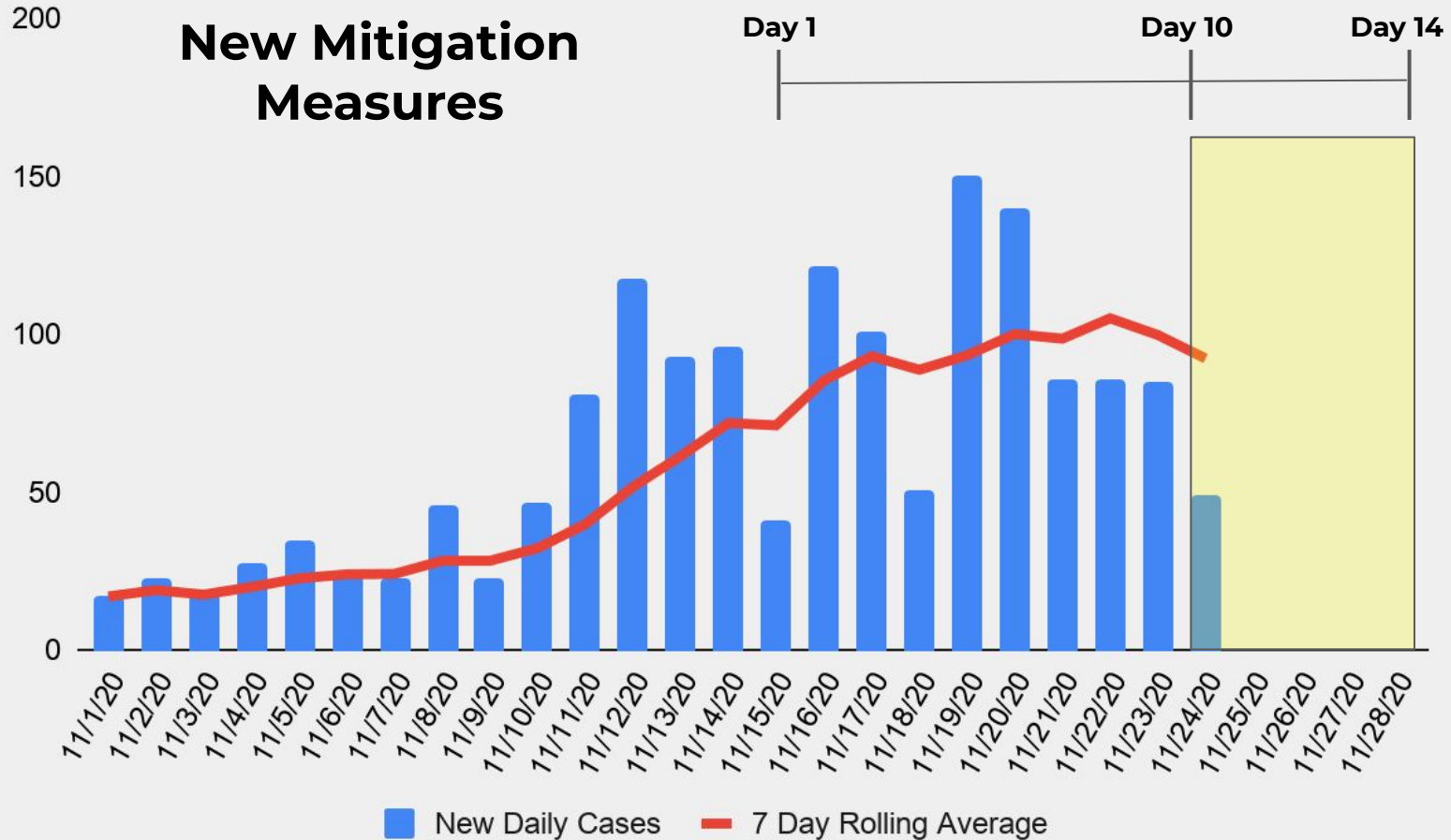
Results Reported November 17 to 23



Vermonters With Confirmed Cases by Week

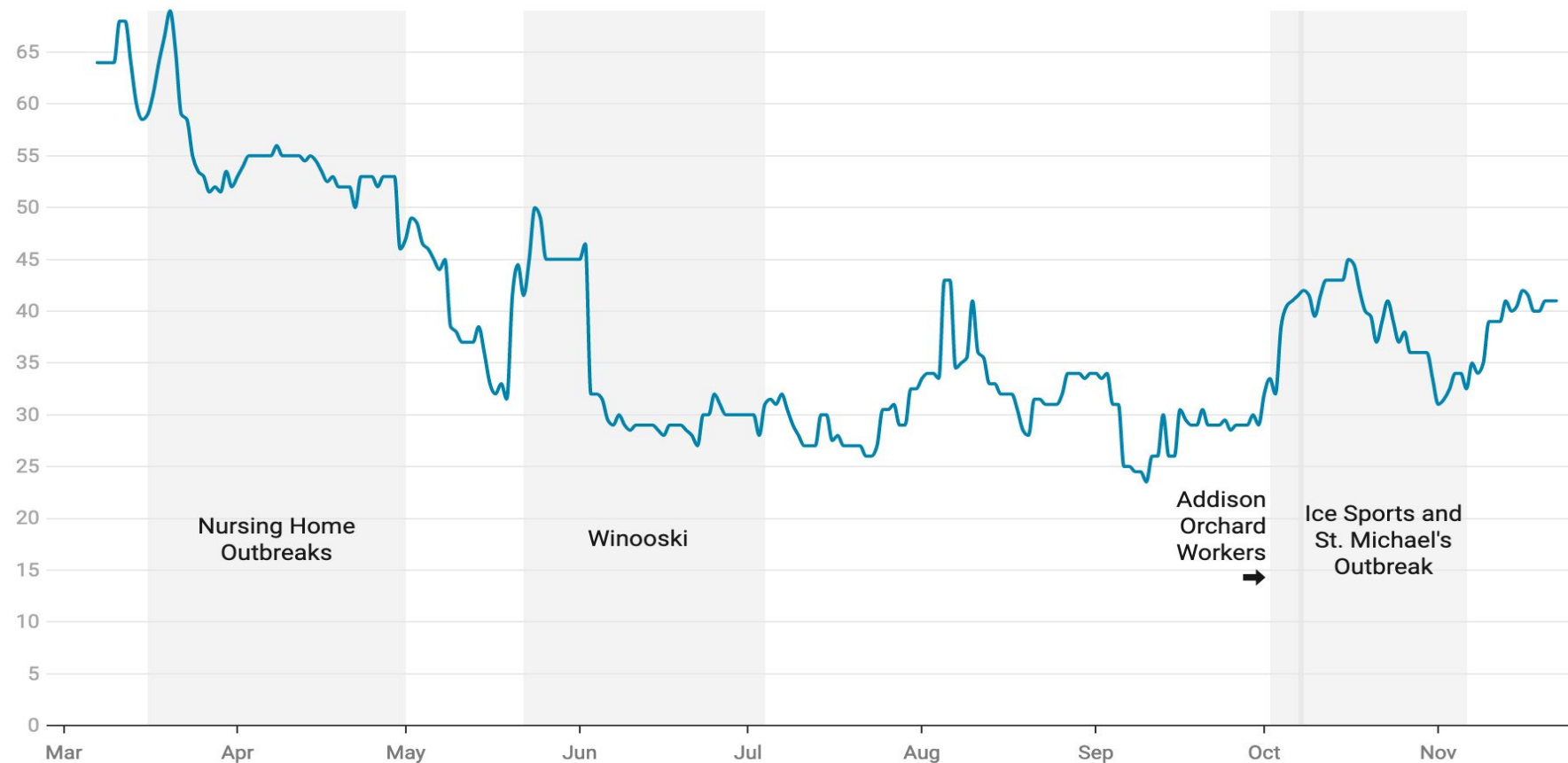


New Mitigation Measures



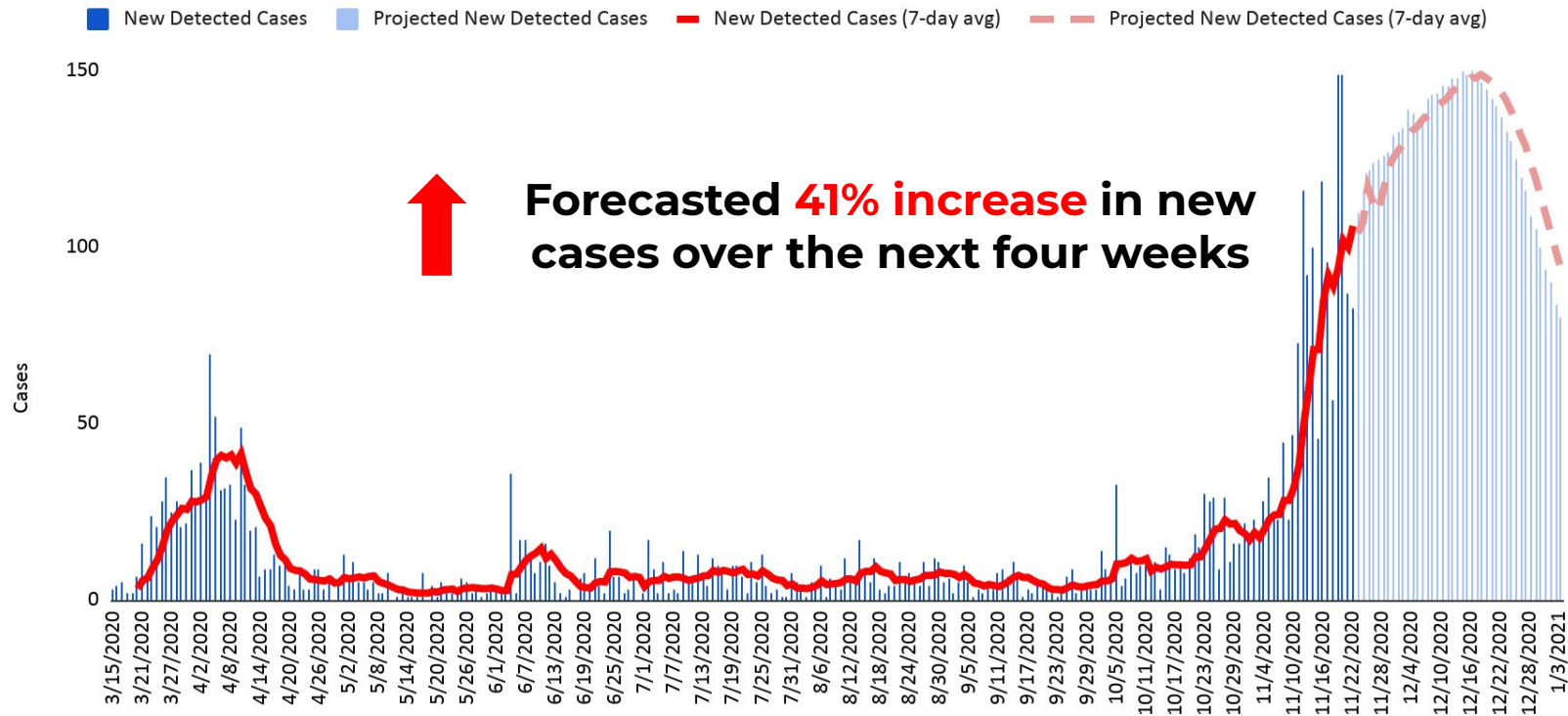
Age of VT COVID Cases

Calculated as the 14-day rolling median of the age of confirmed positives.



Vermont New Case Forecast

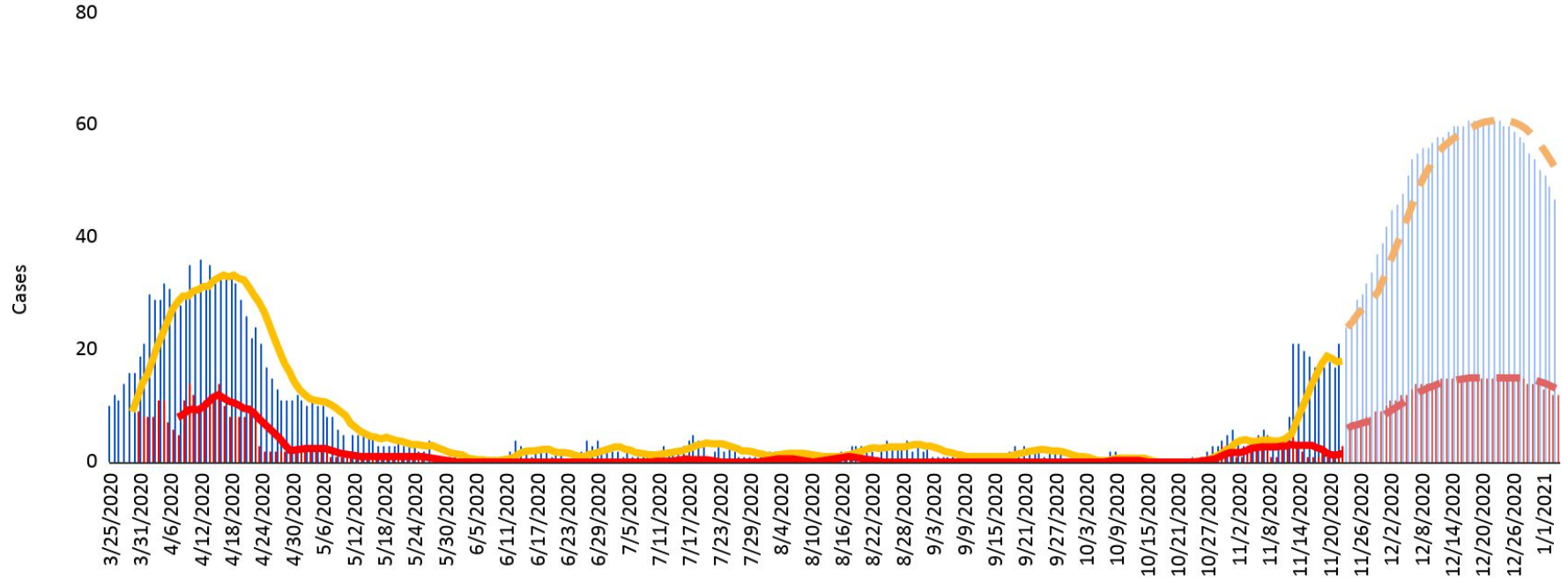
Vermont Forecast



Vermont Hospital & ICU Forecast

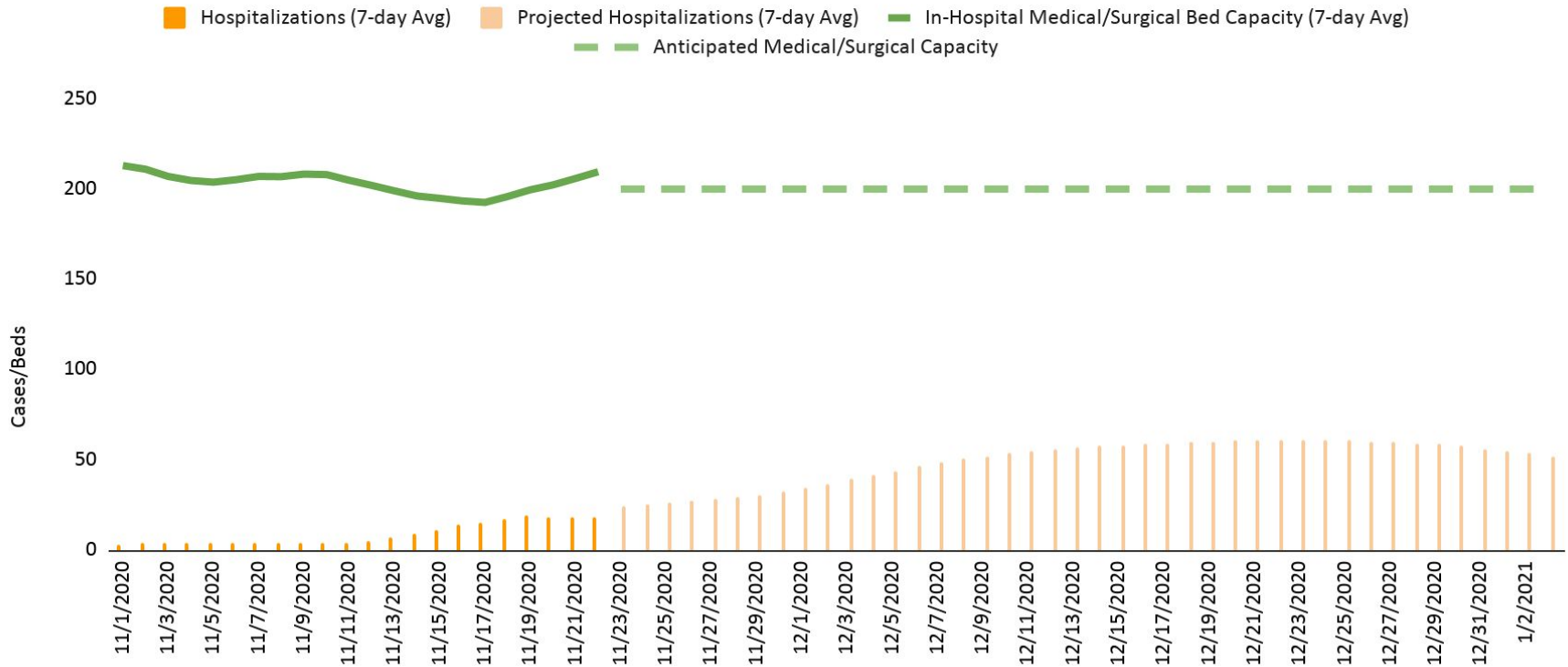
Forecasts Assume 3% Hospitalization & ICU Rate

■ Hospitalizations ■ Projected Hospitalizations ■ ICU ■ Projected ICU ■ Hospitalizations (7-day Avg) ■ Projected Hospitalizations (7-day Avg)
■ ICU (7-day Avg) ■ Projected ICU (7-day Avg)



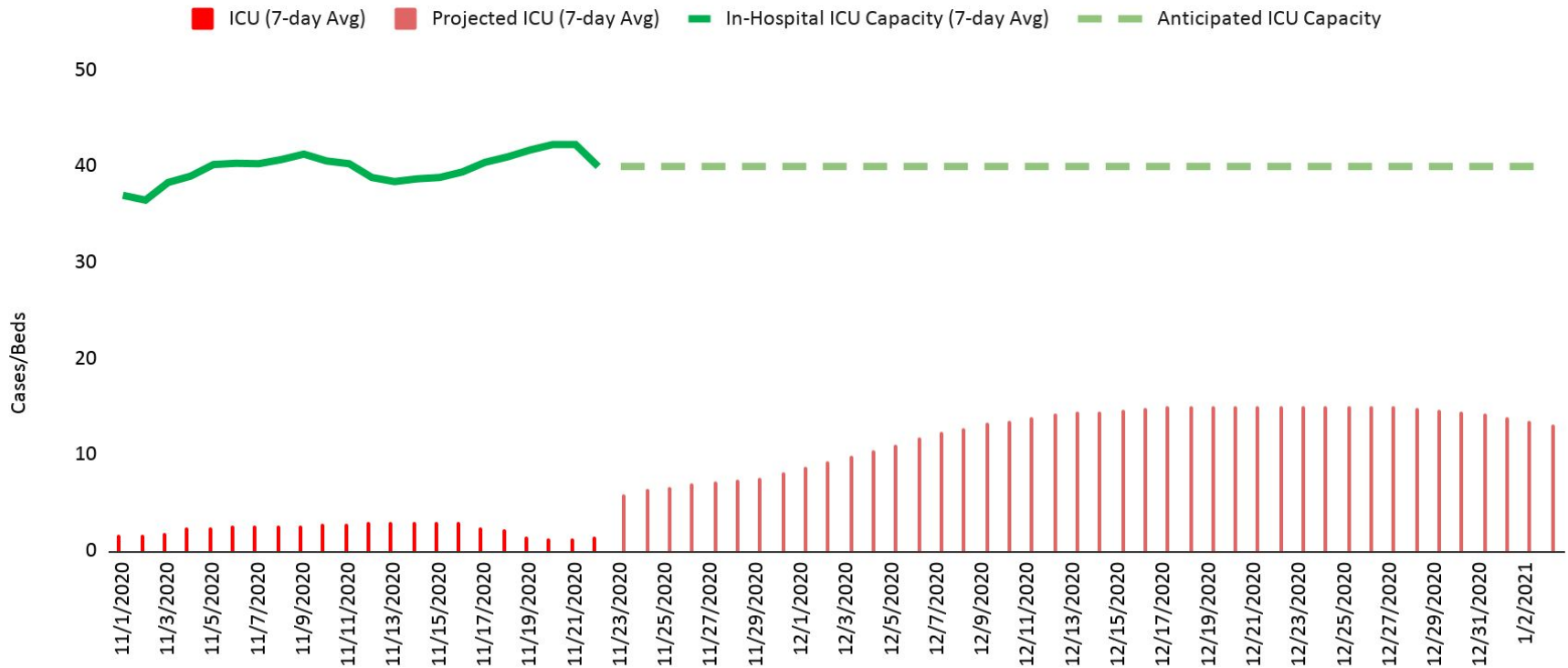
Vermont Hospital Capacity Forecast

Forecasts Assume 3% Hospitalization



Vermont ICU Capacity Forecast

Forecasts Assume 3% ICU Rate



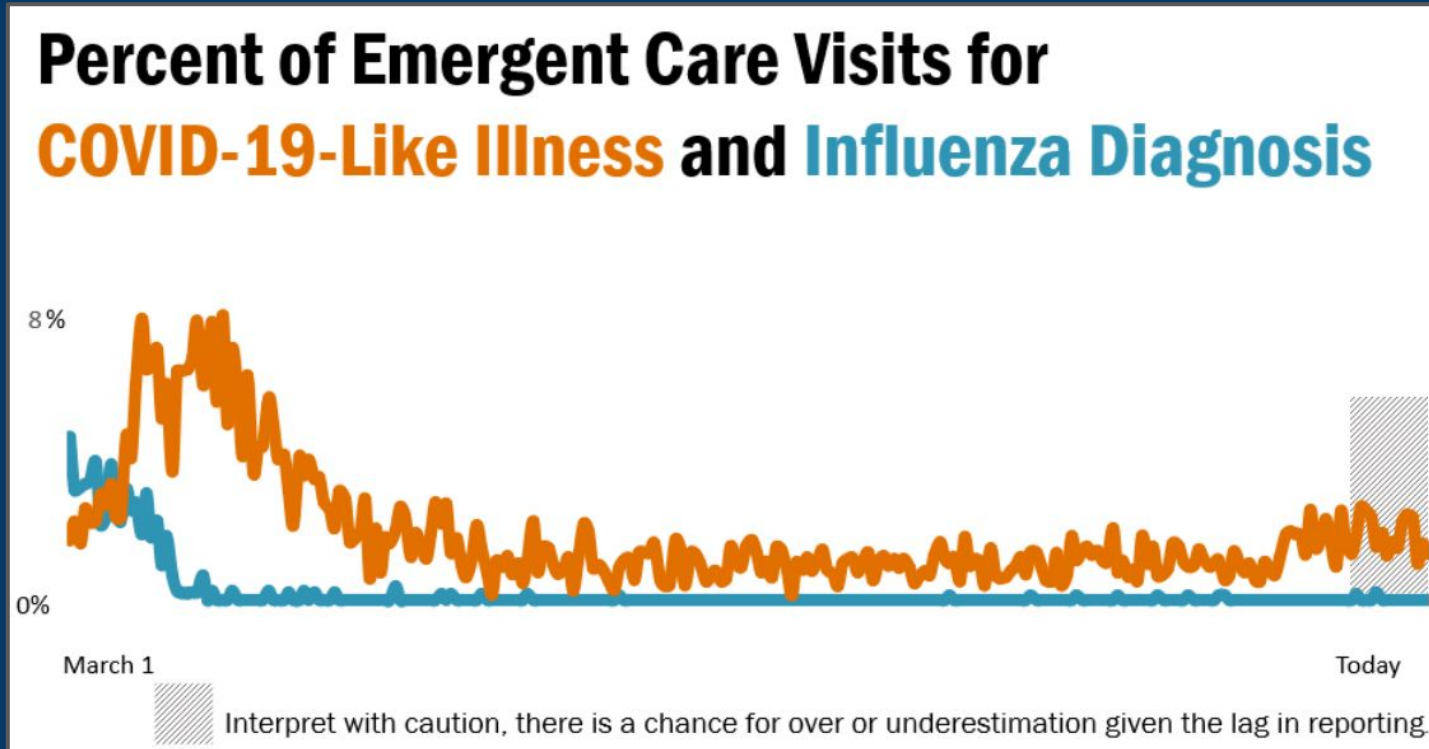
RESTART VERMONT

Reopening Metrics

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

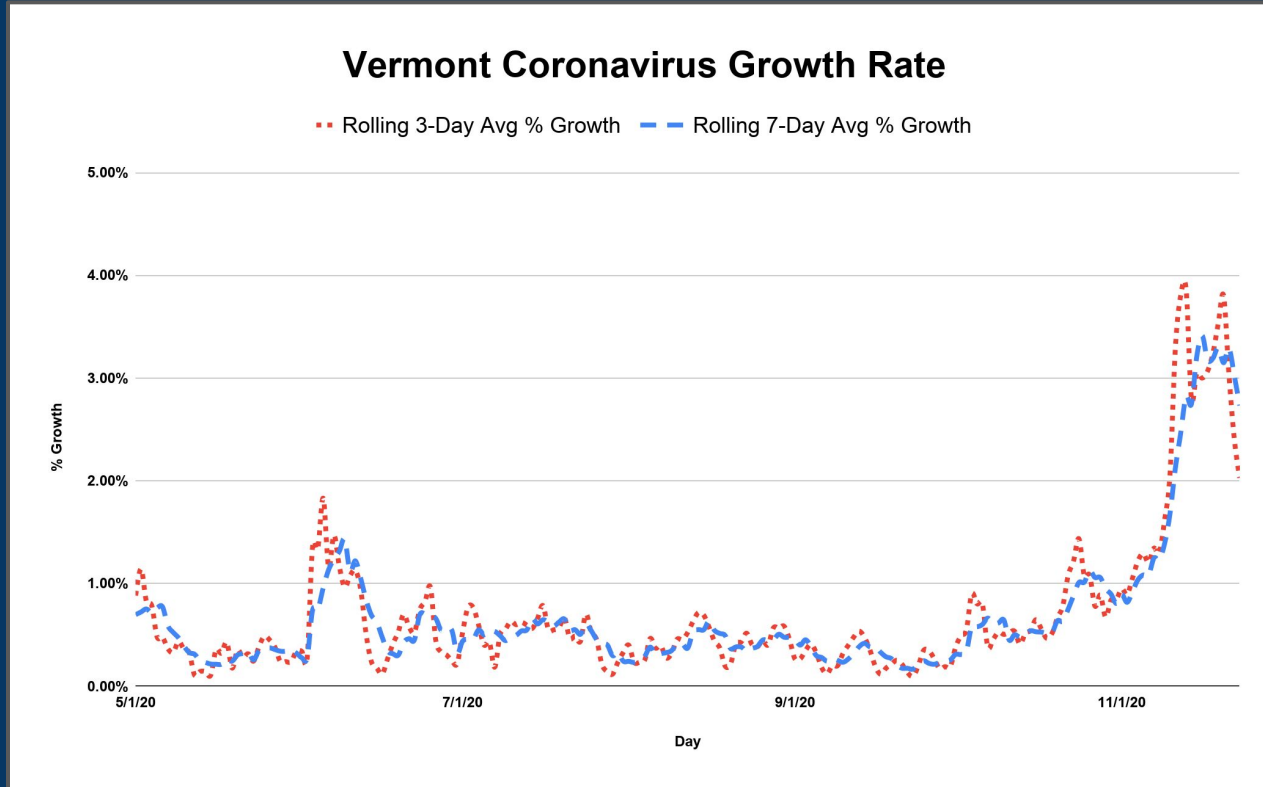
Data Point 1: Syndromic Surveillance

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



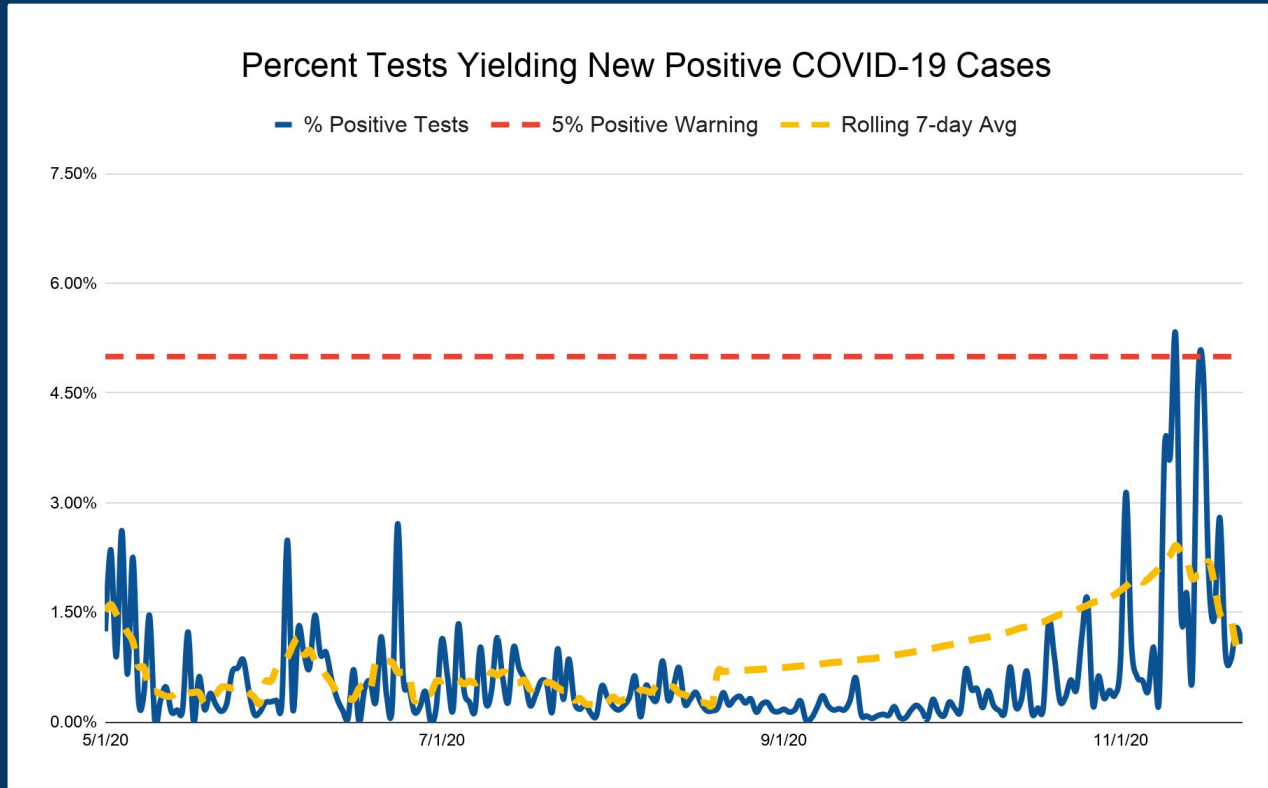
Data Point 2: Viral Growth and Reproductive Rates

- **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



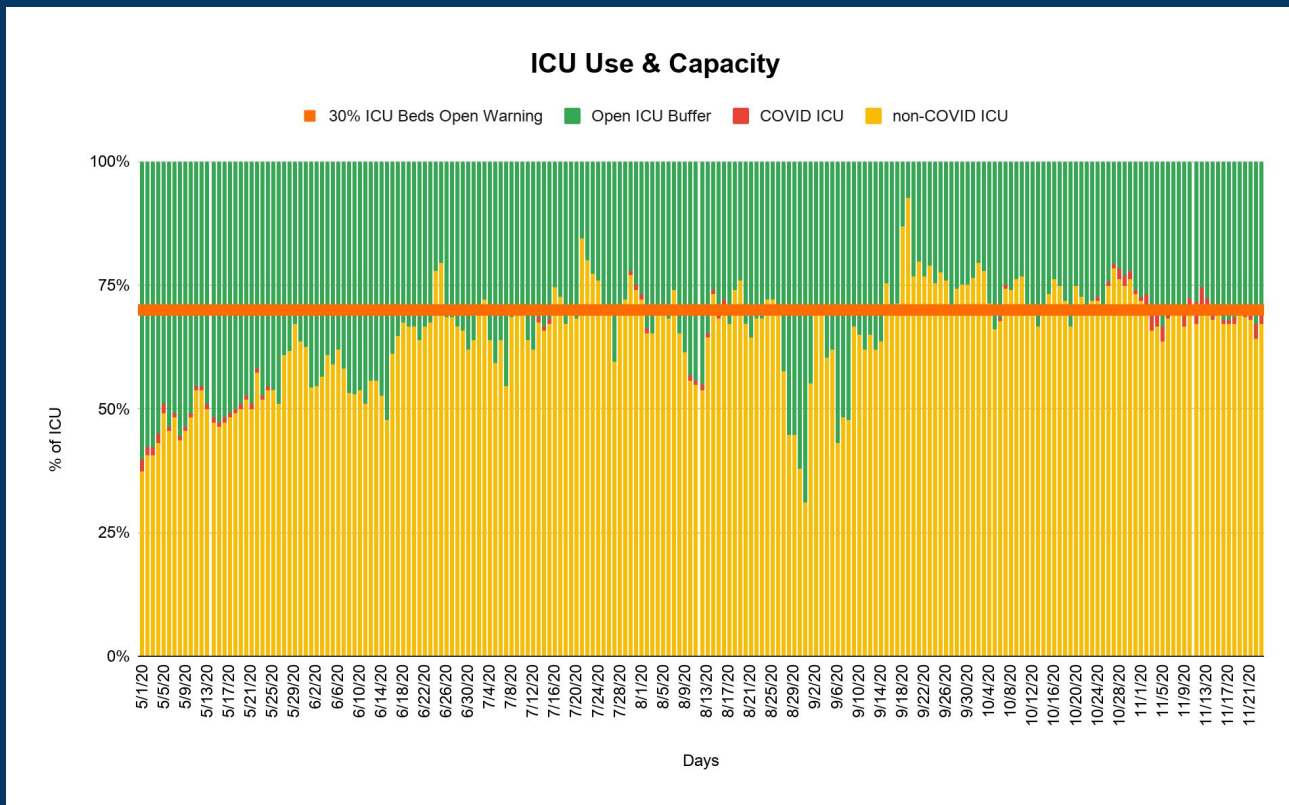
Data Point 3: Percentage of New Positive Tests

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

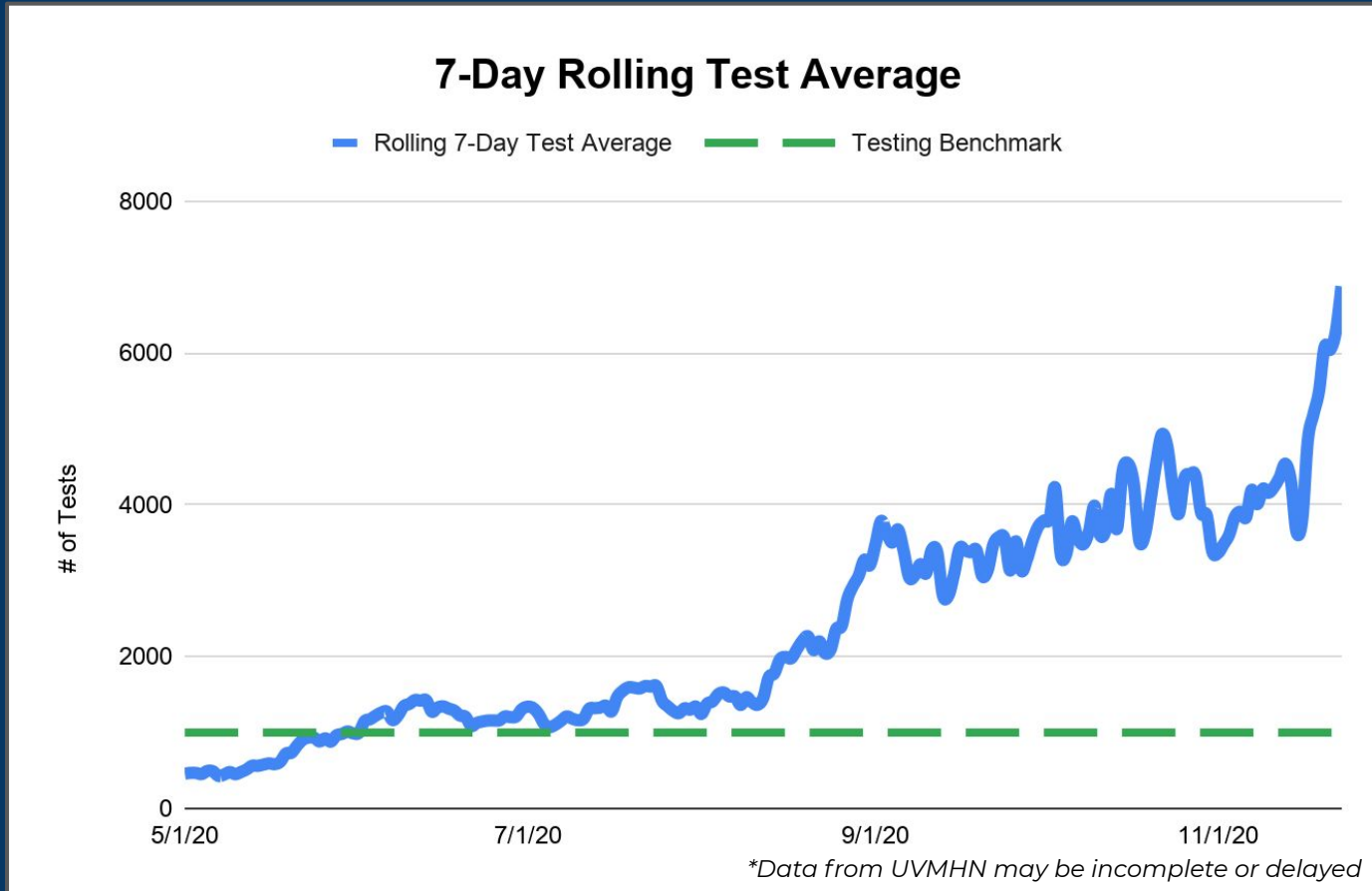


Data Point 4: Hospital & Critical Care Beds

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

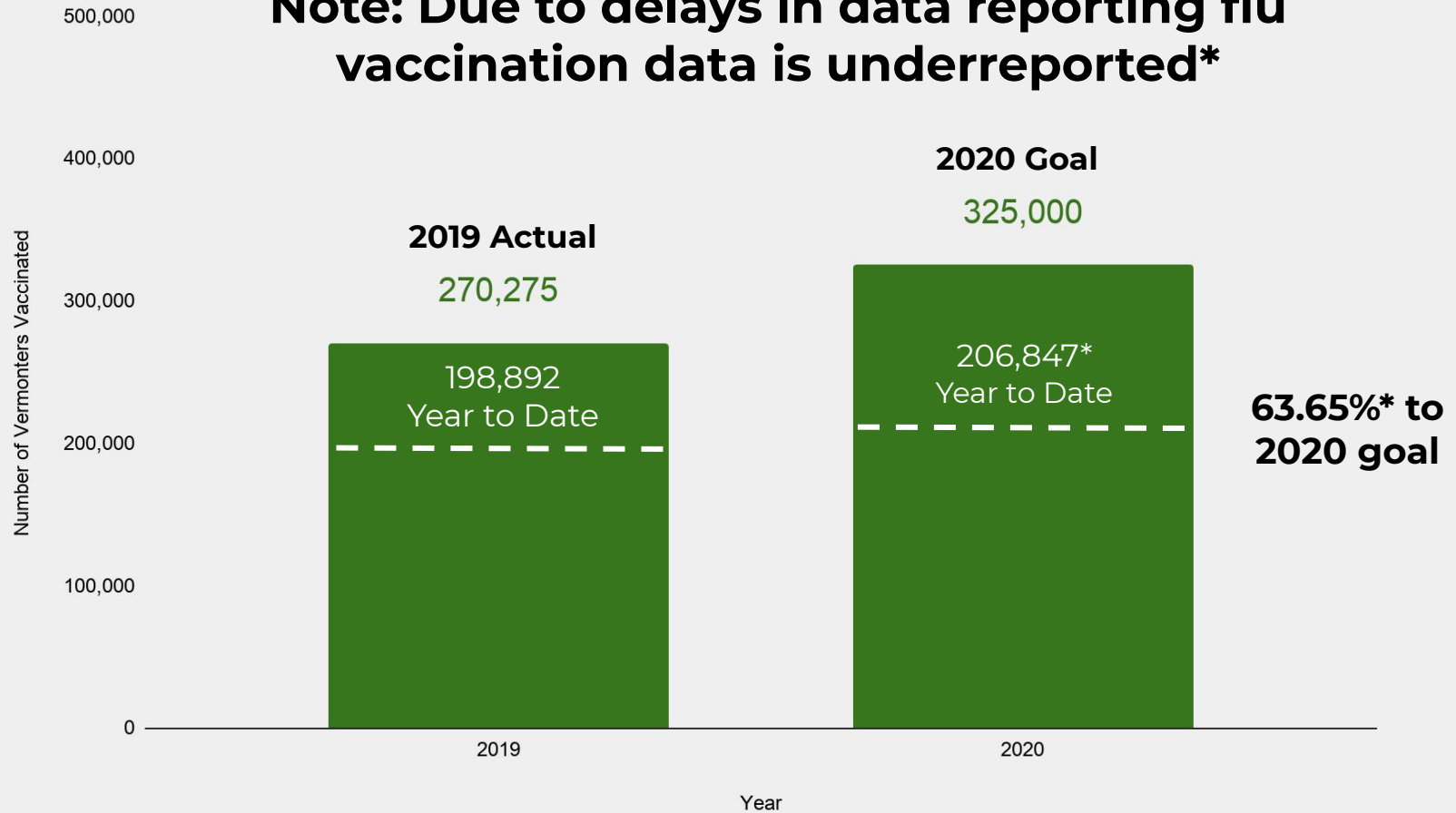


Vermont Testing



Vermont Flu Vaccine Data

Note: Due to delays in data reporting flu vaccination data is underreported*

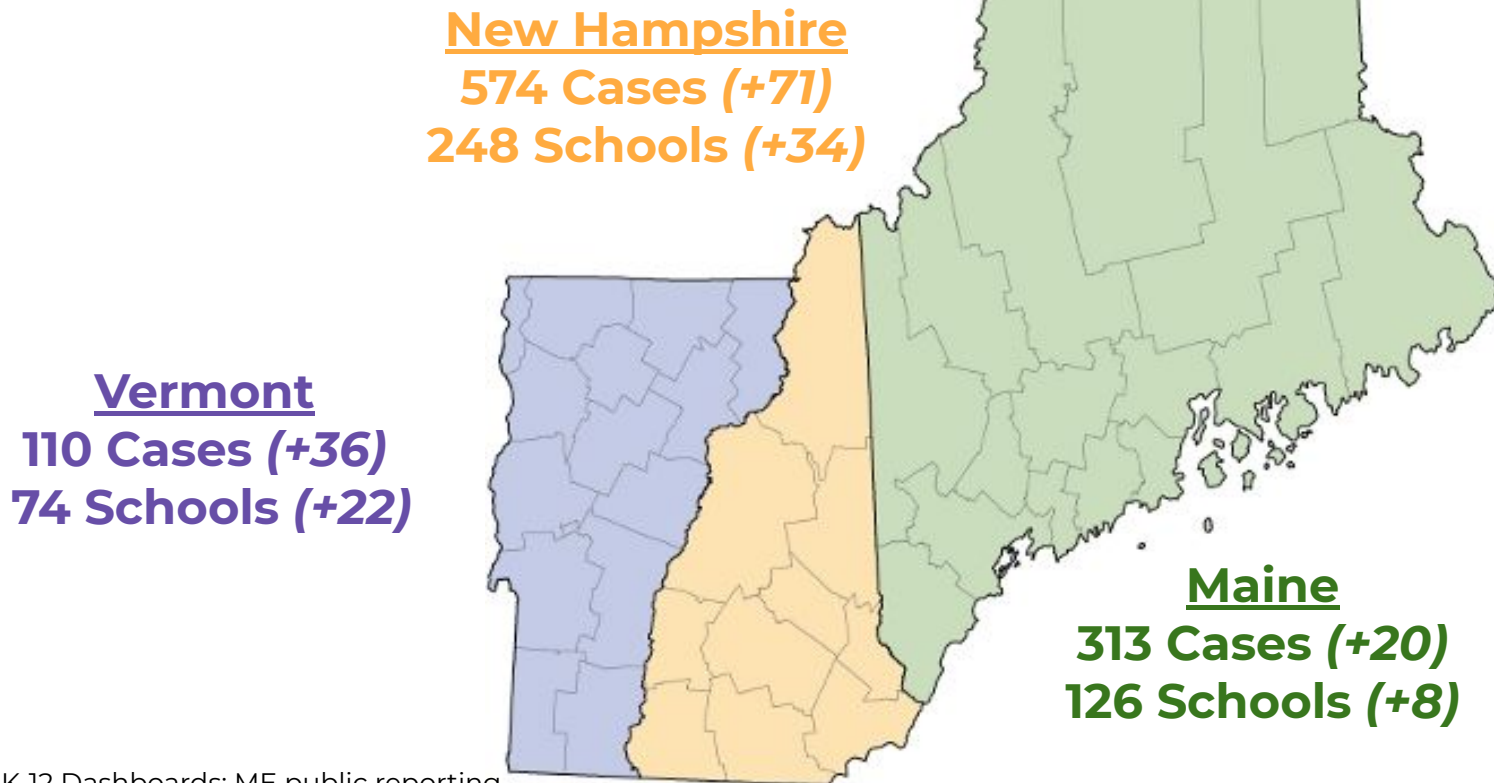


**Data from UVMHN incomplete or delayed; underreported by 25-33%*

Source: Vermont Department of Health & ADS; Immunization Registry; Measured from July 1 to November 15, 2019 & 2020

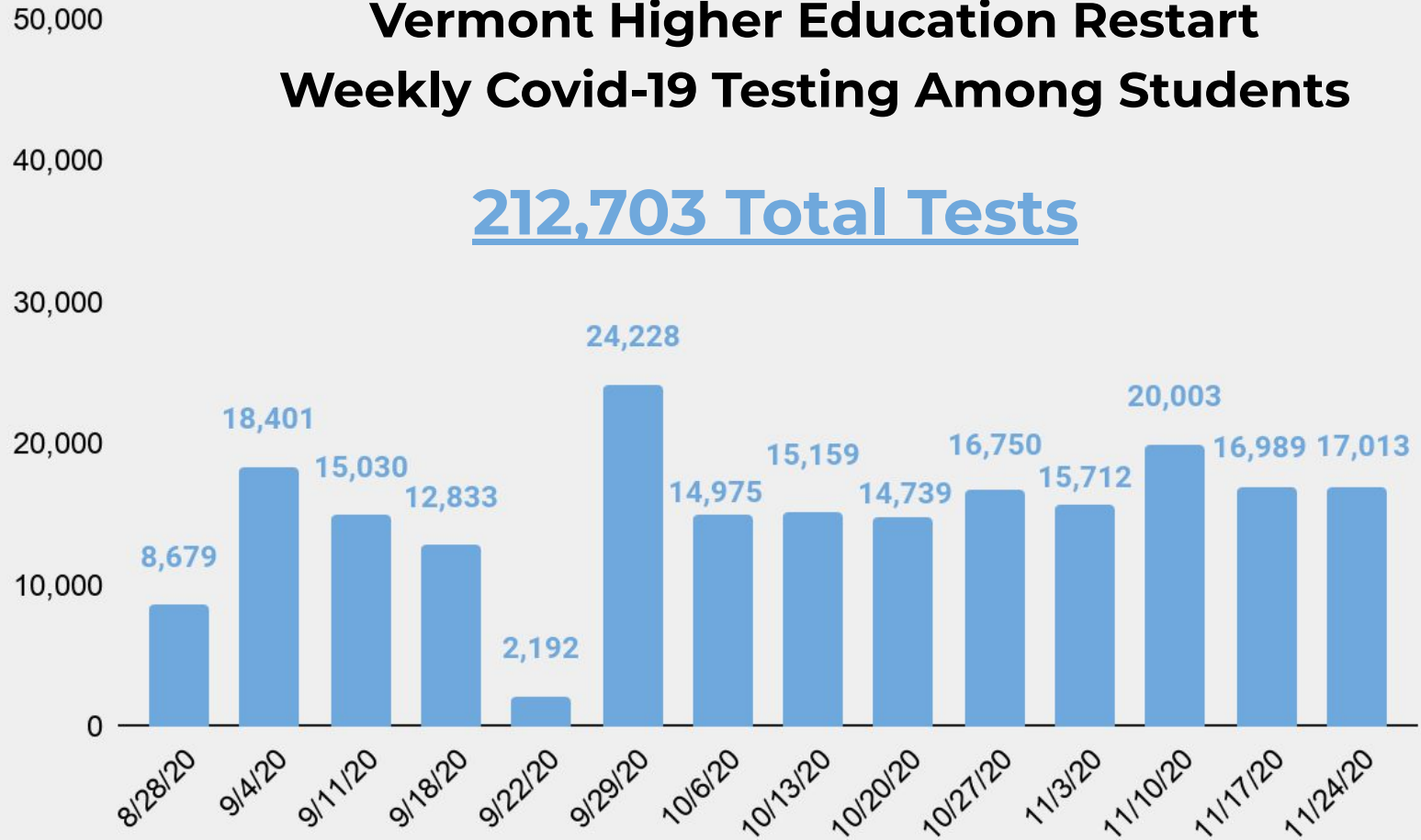
K-12 & Higher Education Update

Covid-19 Cases in K-12 Public Schools Across Northern New England



Vermont Higher Education Restart Weekly Covid-19 Testing Among Students

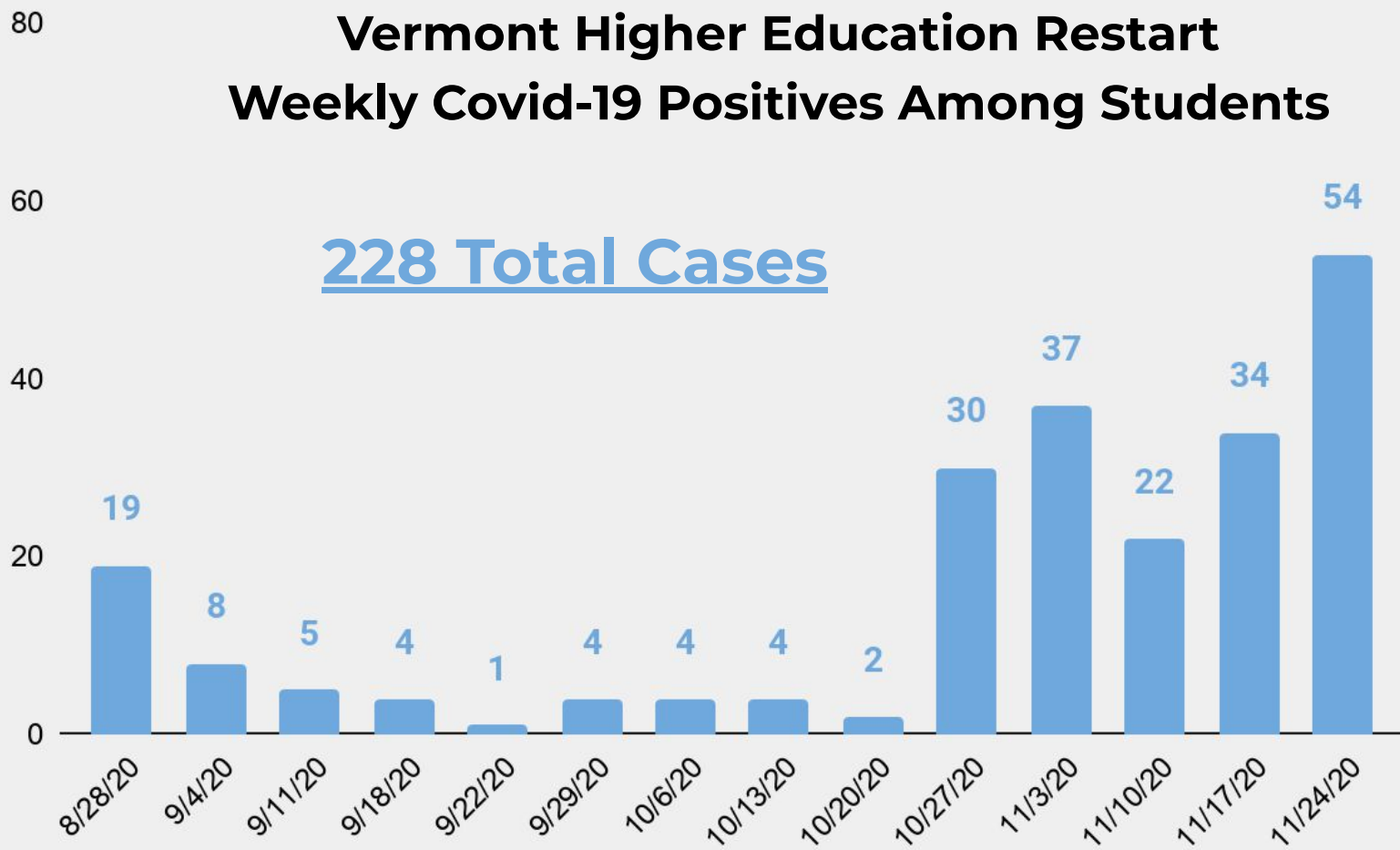
212,703 Total Tests



Source: Vermont Colleges and Universities (presentation switched to Tuesday on September 22, 2020)

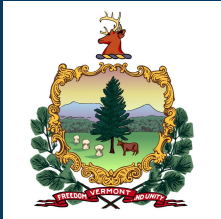
Vermont Higher Education Restart Weekly Covid-19 Positives Among Students

228 Total Cases



Source: Vermont Colleges and Universities (presentation switched to Tuesday on September 22, 2020)

Northern New England Higher Education Update

		Total Tests	Positives	Positivity Rate
New Hampshire*		421,355 +16,469	706 +122	0.14%
Maine*		144,513 +11,789	218 +60	0.12%
Vermont		212,703 +17,013	228 +54	0.11%

* Includes NH & ME colleges & universities that publicly provide COVID-19 testing data.

Vermont Higher Education Restart

Institution Data as of November 24, 2020

College / University	Total Tests	Student Positives	Employee Positives	Dashboard / Public Information
Middlebury College	13,580	5	2	https://www.middlebury.edu/office/midd2021/covid-reporting-dashboard
University of Vermont	138,024	92	14	https://www.uvm.edu/returntocampus/uvm-weekly-testing-report
Norwich University	16,470	15	1	https://www.norwich.edu/news/psa
Northern Vermont University	5,331	10	1	https://www.northernvermont.edu/nvu-during-covid-19
Castleton University	1,403	3	0	https://www.castleton.edu/covid-19-coronavirus-updates/covid-19-test-results/
Vermont Technical College	561	6	1	https://www.vtc.edu/update-on-the-covid-19-coronavirus/
Saint Michael's College	9,489	79	0	https://www.smcvt.edu/return-to-campus/
Sterling College	212	0	0	https://sterlingcollege.edu/coronavirus-2019/
Champlain College	17,959	11	0	https://view.champlain.edu/champlain-college-covid-19-testing-dashboard/
Bennington College	6,962	3	0	https://www.bennington.edu/covid-19-updates-and-information
Vermont College of Fine Arts	165	0	0	Does not have a public dashboard at this time
Vermont Law School	7	0	0	Remote learning for Fall 2020 - Some students using campus facilities
Landmark College	2,390	3	2	https://www.landmark.edu/student-life/health-counseling-wellness/covid-19/covid-19-dashboard
Albany College of Pharmacy	150	1	0	https://www.acphs.edu/health-safety
Totals	212,703	228	21	

Note: Goddard College & Community College of Vermont are remote for Fall 2020

Active Outbreaks in Long Term Care Facilities

Facility Name	COVID-19 Cases
Rutland Health & Rehab <i>Rutland</i>	41
Four Seasons Care Home <i>Northfield</i>	38
Berlin Health & Rehab <i>Berlin</i>	7
Valley Vista <i>Bradford</i>	7
Averill Place <i>Barre</i>	4
Residence at Quarry Hill <i>South Burlington</i>	3
Total	100

Source: Vermont Department of Health - November 23, 2020 (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)