COVID-19 Modeling
November 17, 2020

Presentation available at:
dfr.vermont.gov

11 Million+ U.S. Cases

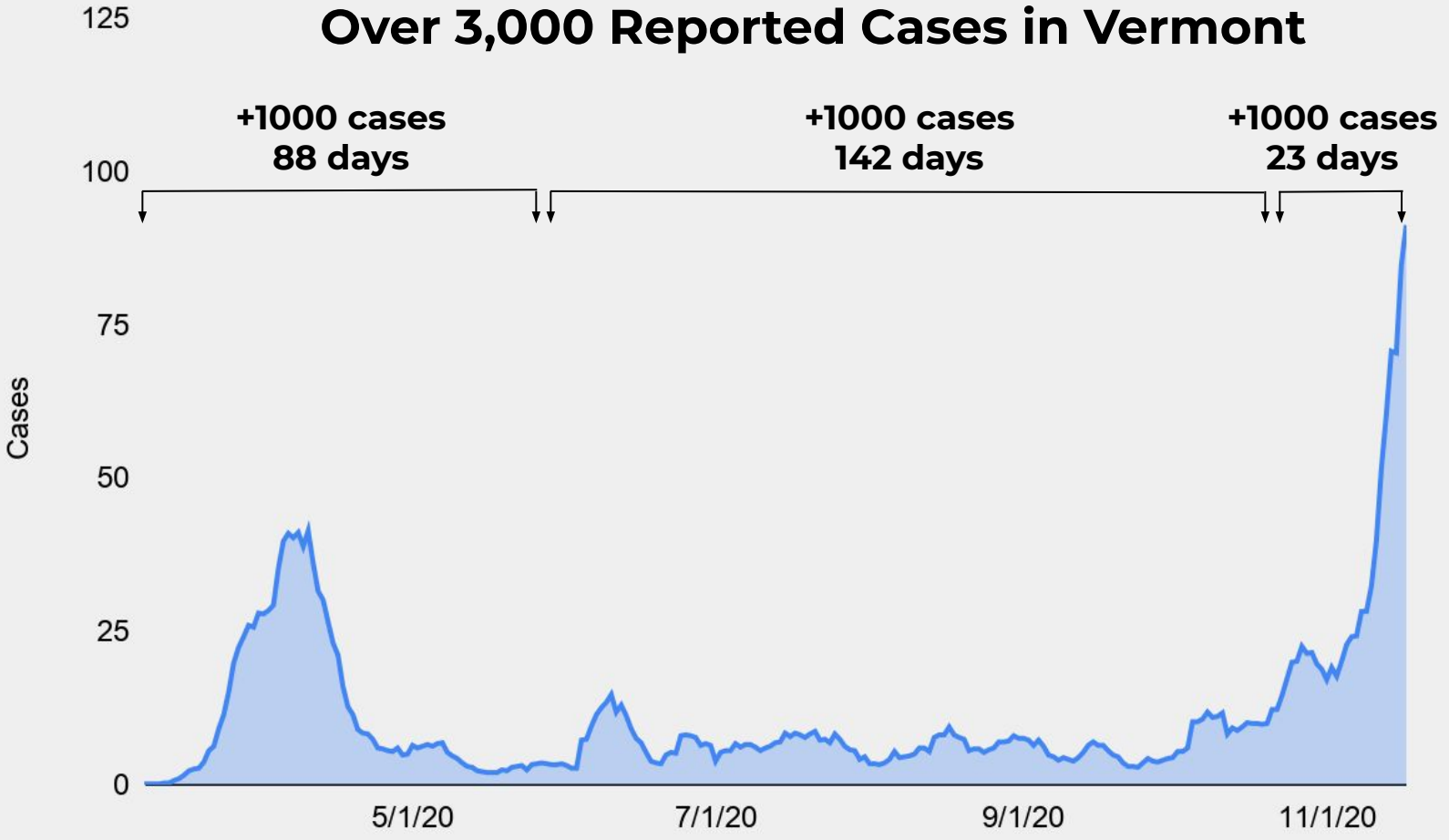
November 15, 2020

1 Million Cases	*99 Days*	6 Million Cases	*23 Days*
2 Million Cases	*43 Days*	7 Million Cases	*27 Days*
3 Million Cases	*28 Days*	8 Million Cases	*20 Days*
4 Million Cases	*15 Days*	9 Million Cases	*13 Days*
5 Million Cases	*17 Days*	10 Million Cases	*10 Days*

11 Million Cases *6 Days*

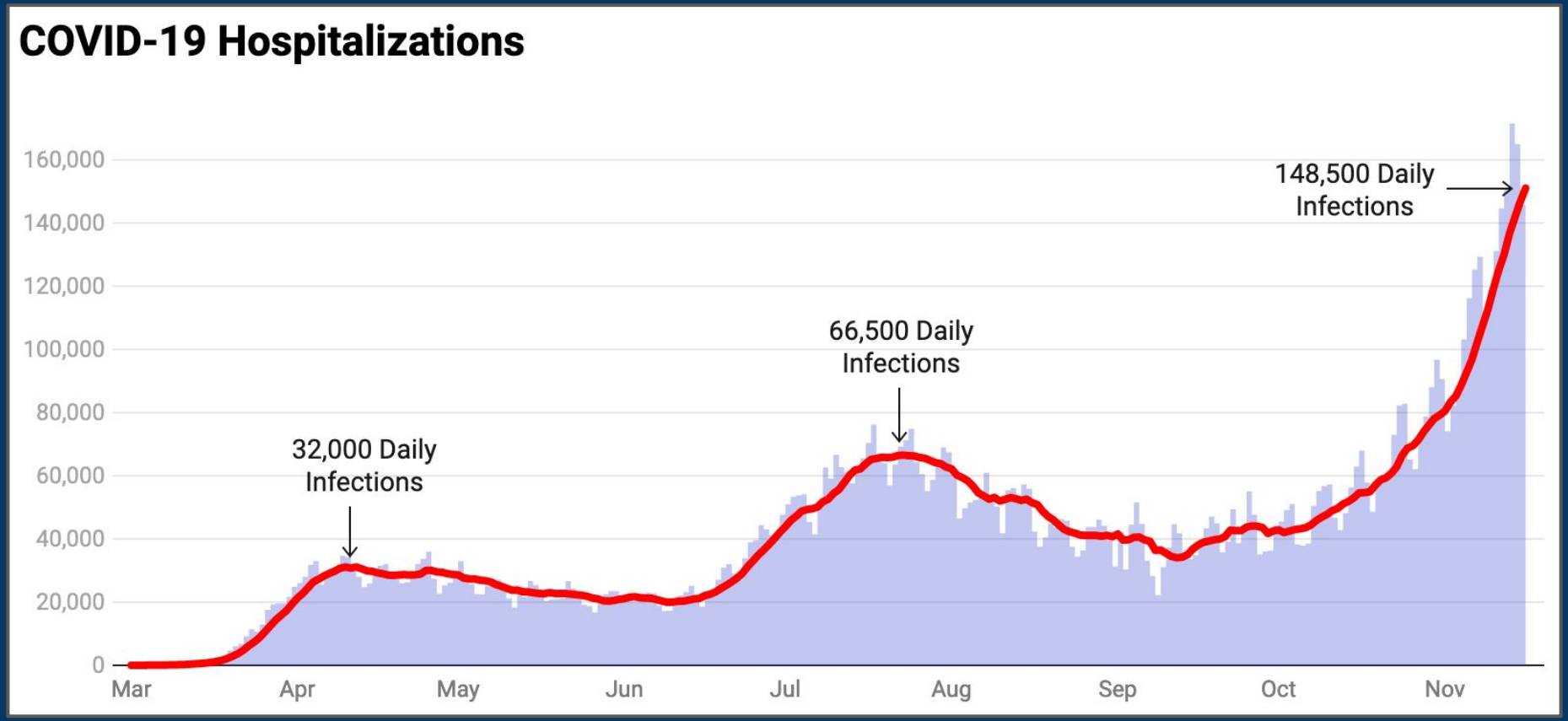
Source: Johns Hopkins University

Over 3,000 Reported Cases in Vermont



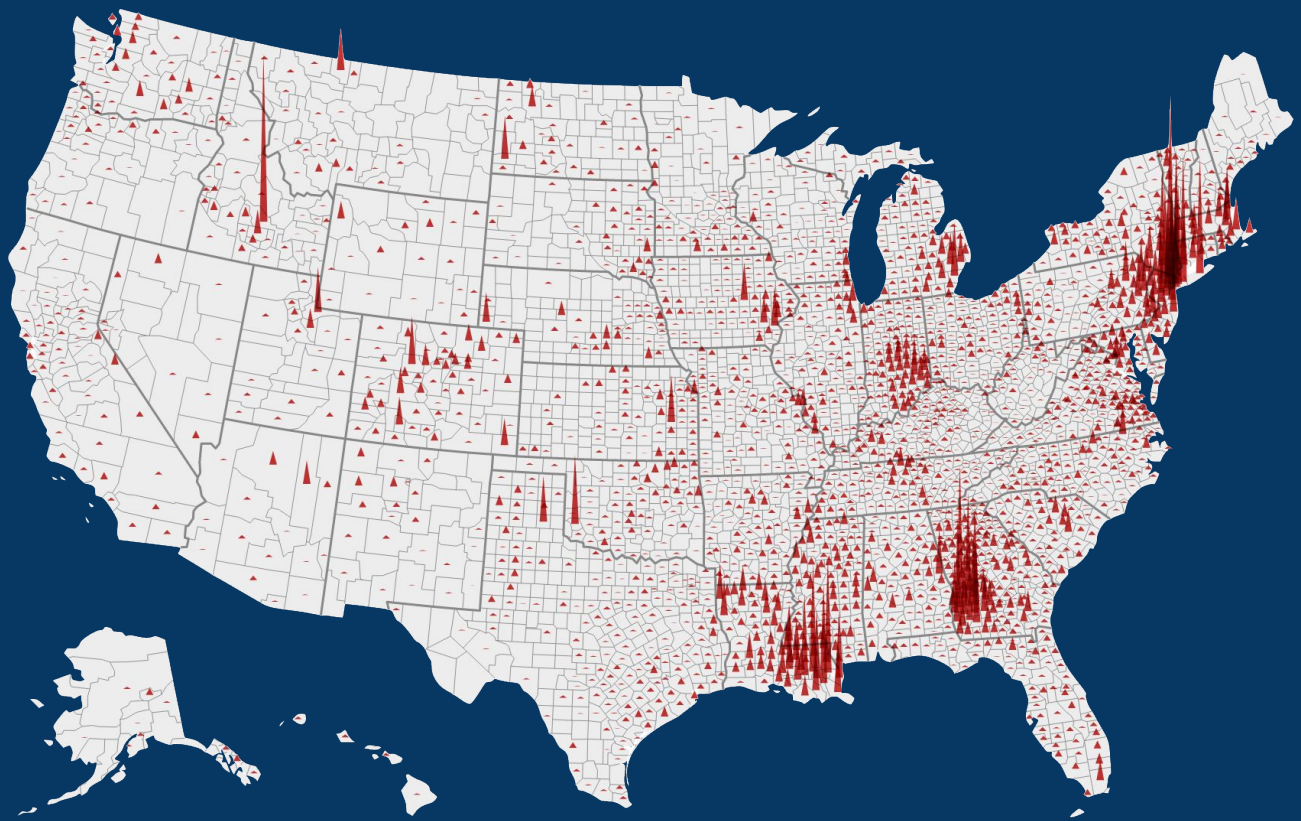
Sources: Vermont Department of Health

U.S. Case Growth



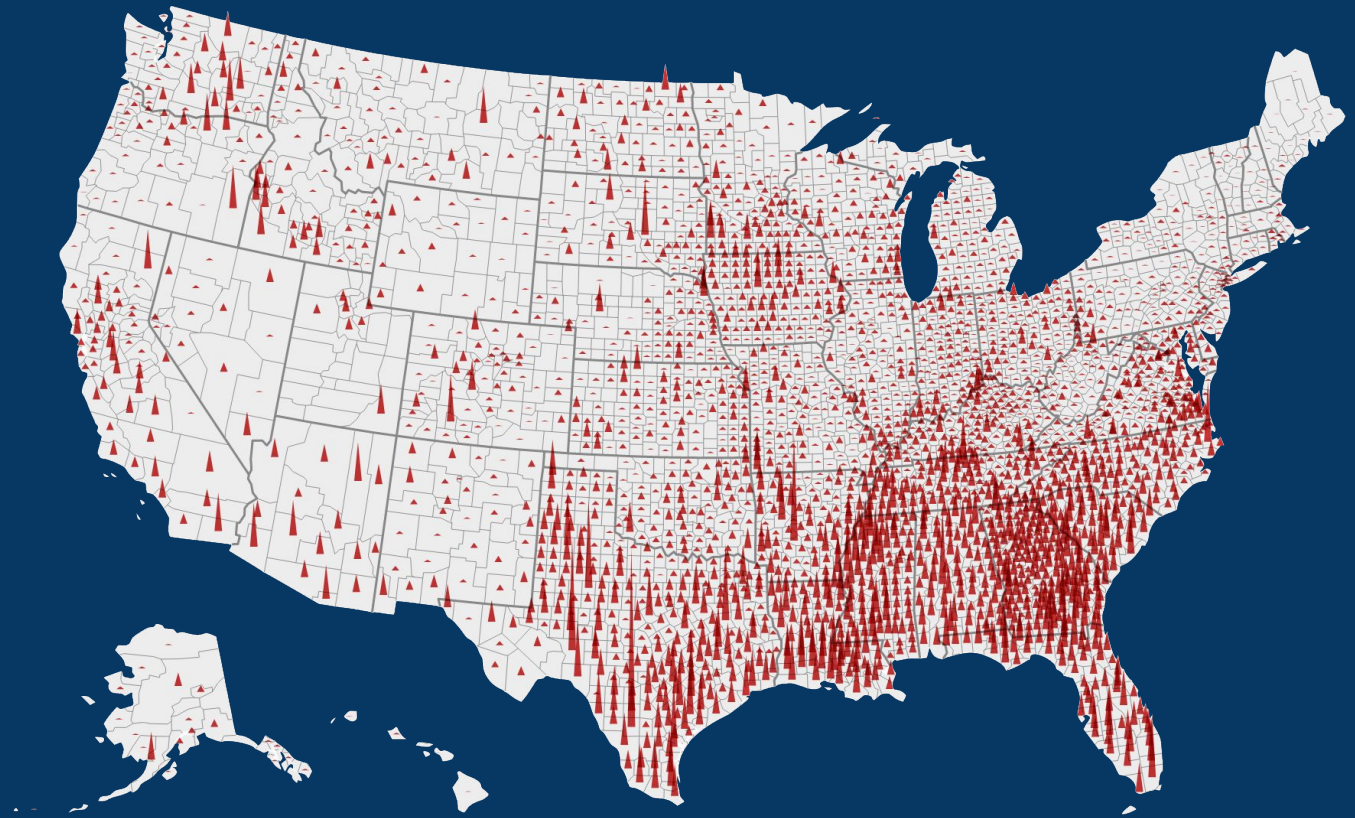
Source: Covid Tracking Project

First Peak Spring 2020
Primarily Centered in Northeast



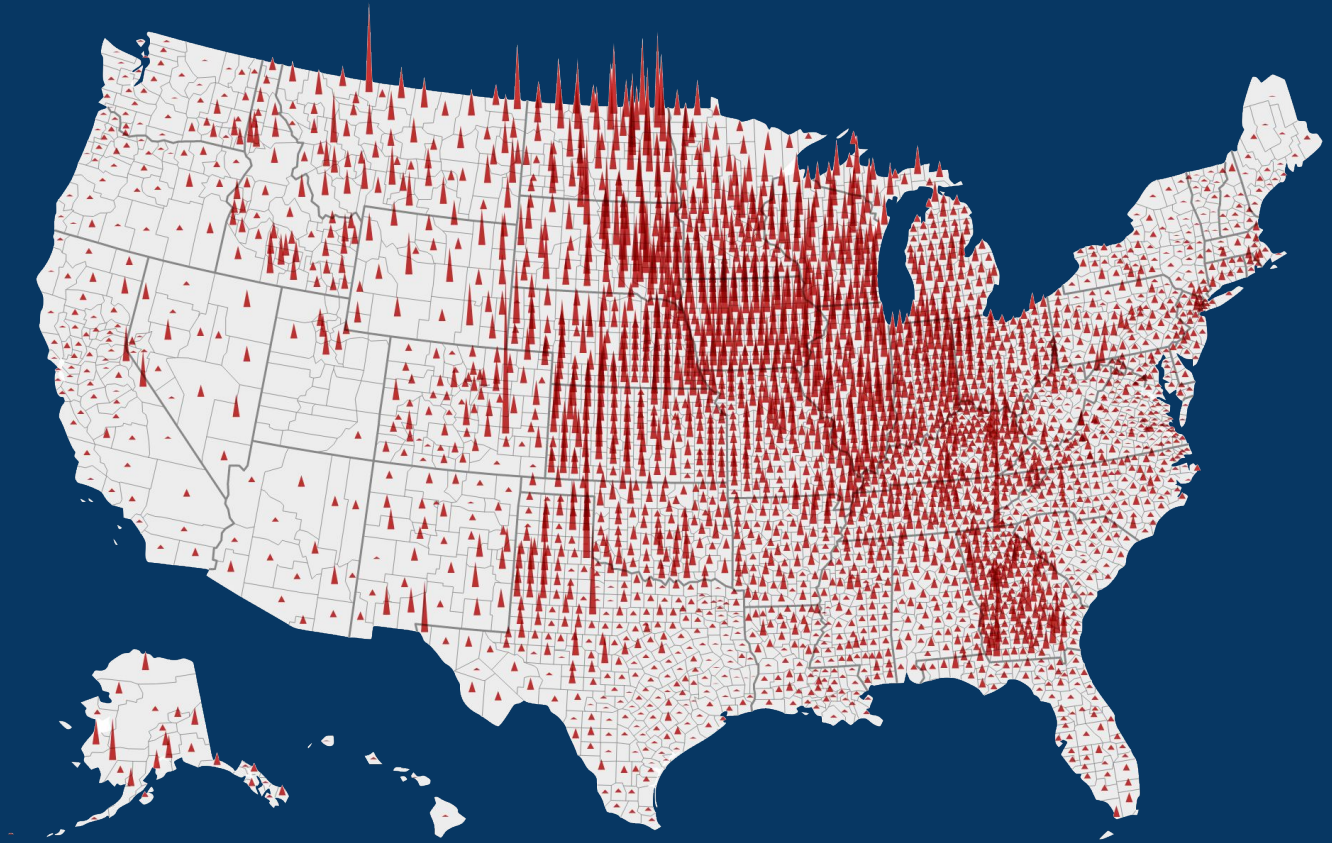
Source: Raw data from Johns Hopkins University—April 10, 2020

Second Peak Summer 2020
Primarily Centered in South & West



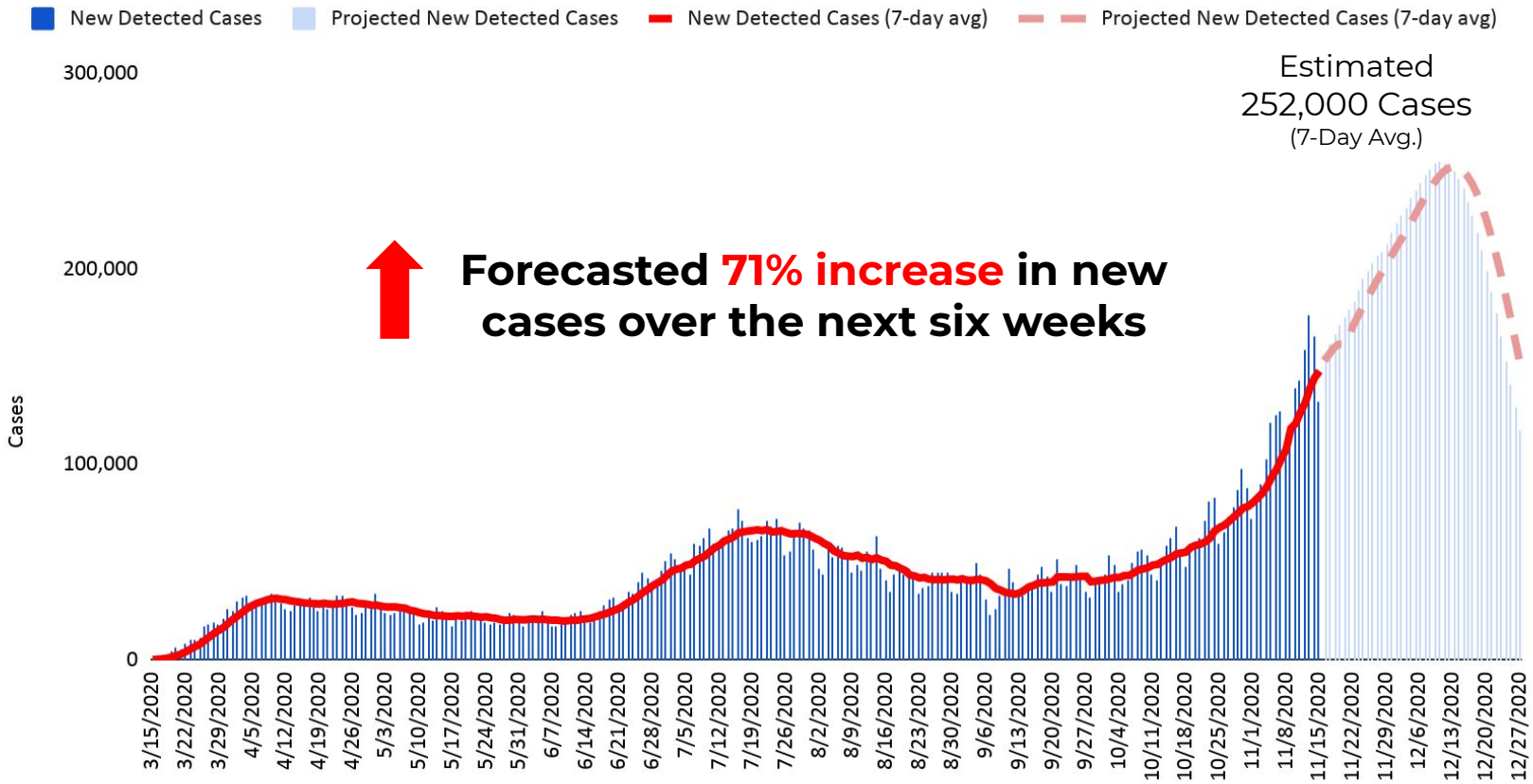
Source: Raw data from Johns Hopkins University—July 19, 2020

Third Peak Fall 2020
Geographically Diverse



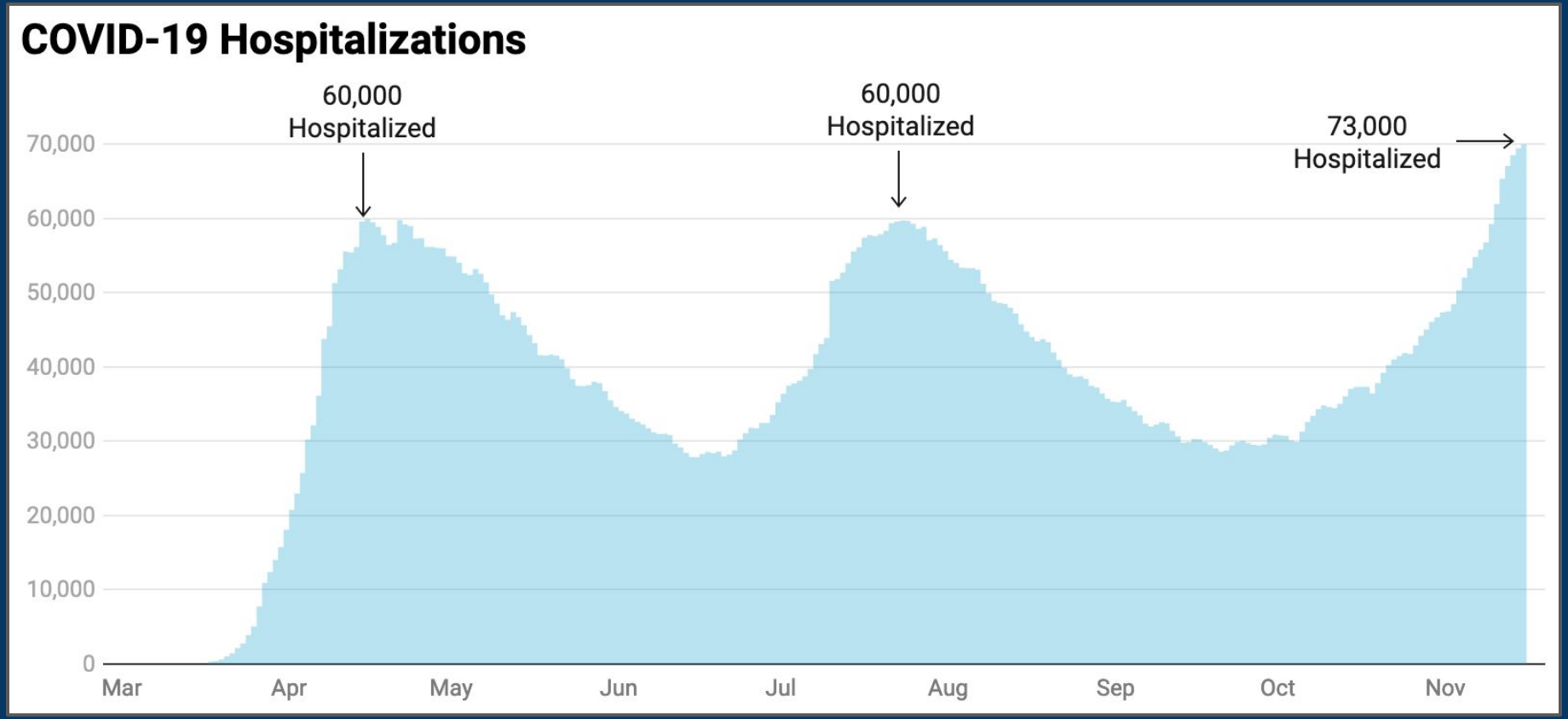
Source: Raw data from Johns Hopkins University—October 20, 2020

National Forecast



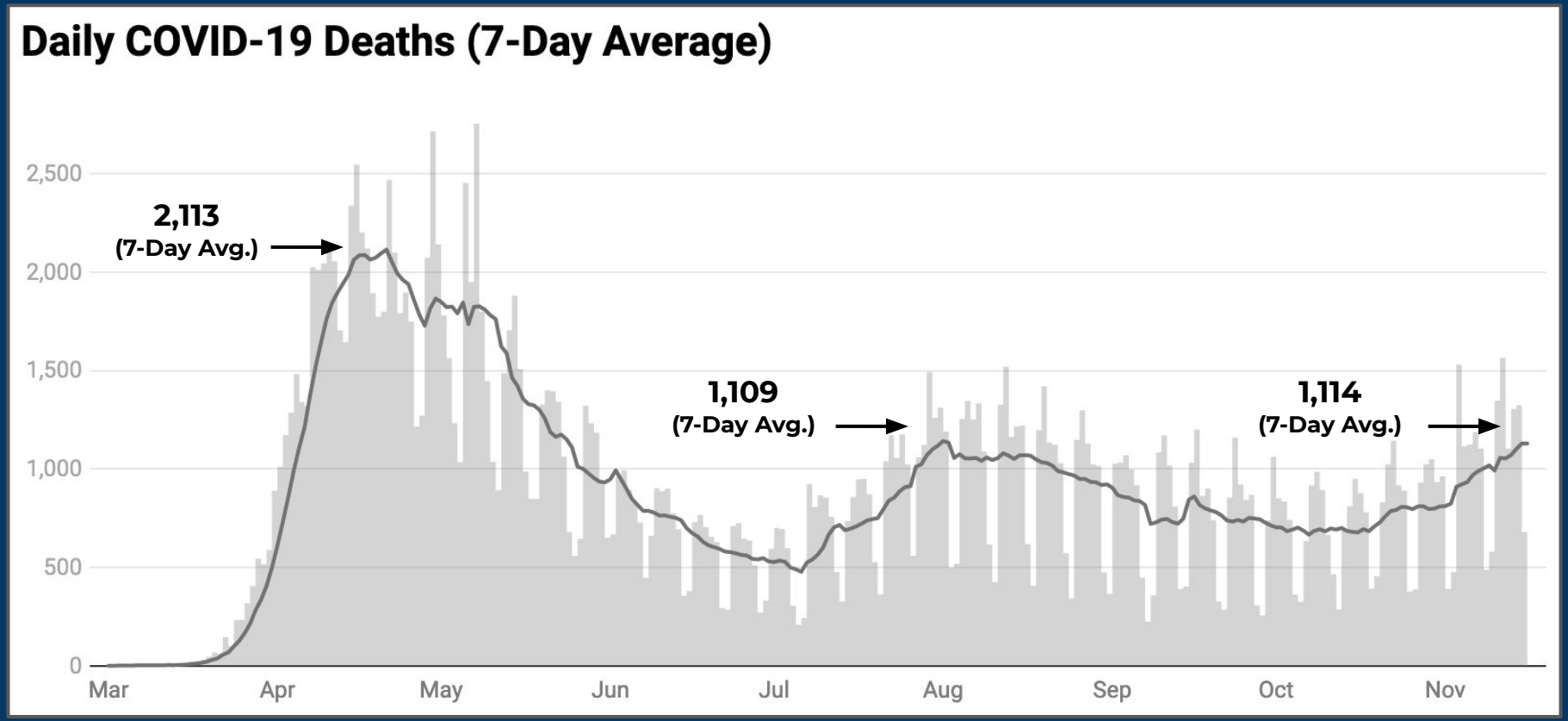
Source: Johns Hopkins University Data & Oliver Wyman Forecast Model - November 17, 2020

U.S. Hospitalization Growth



Source: Raw data from COVID Tracking Project—November 16, 2020

U.S. Covid-19 Deaths



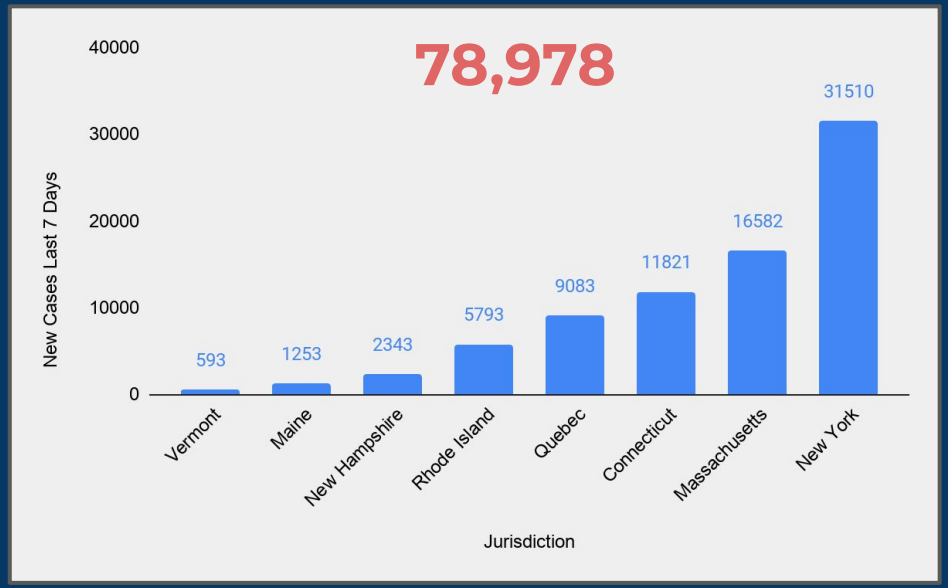
Source: Raw data from COVID Tracking Project

Regional Case Growth

~46.43% Increase in New Confirmed Cases

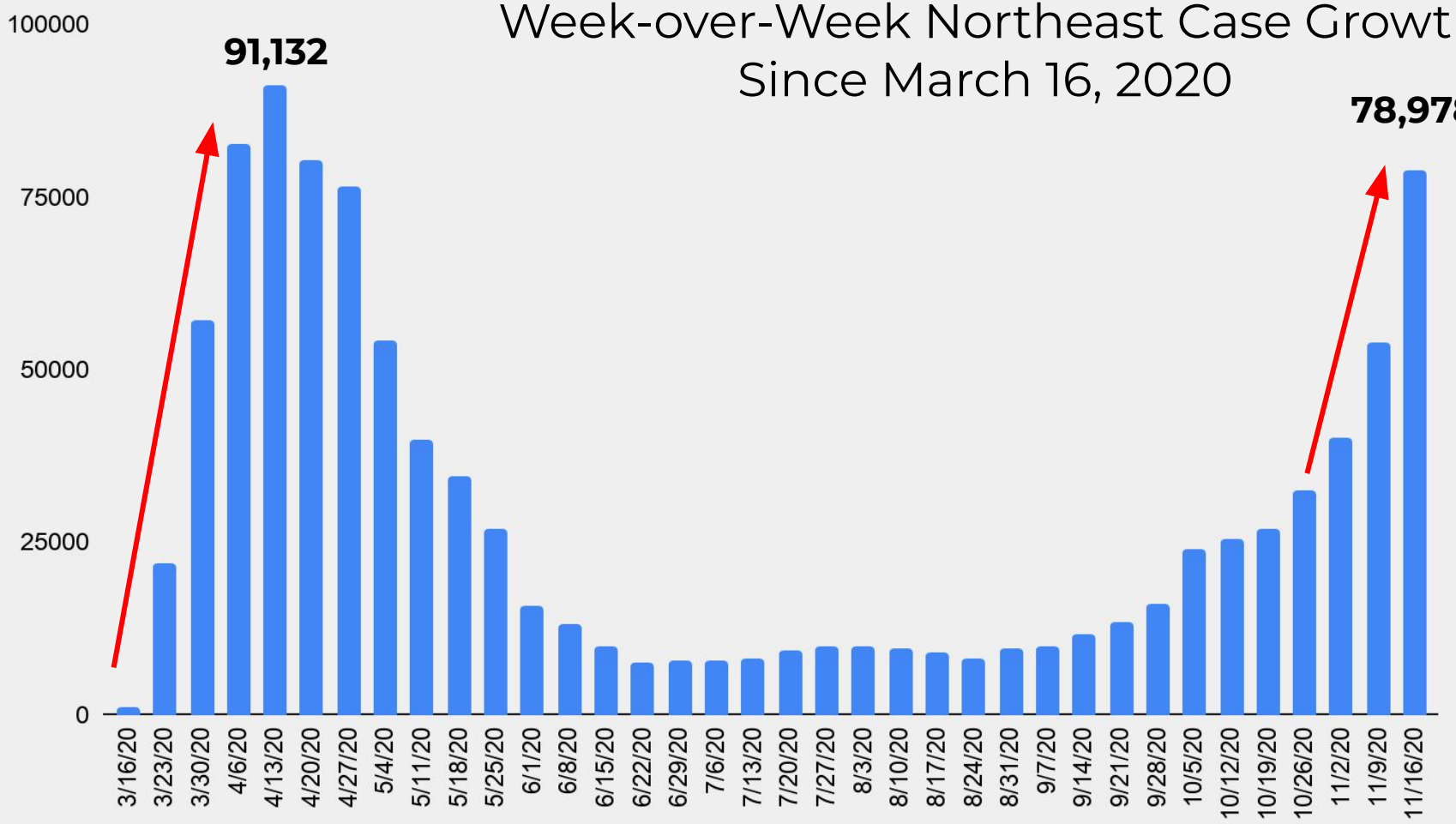
Positive Cases Nov. 3rd to Nov. 9th

Positive Cases Nov. 10th to Nov. 16th



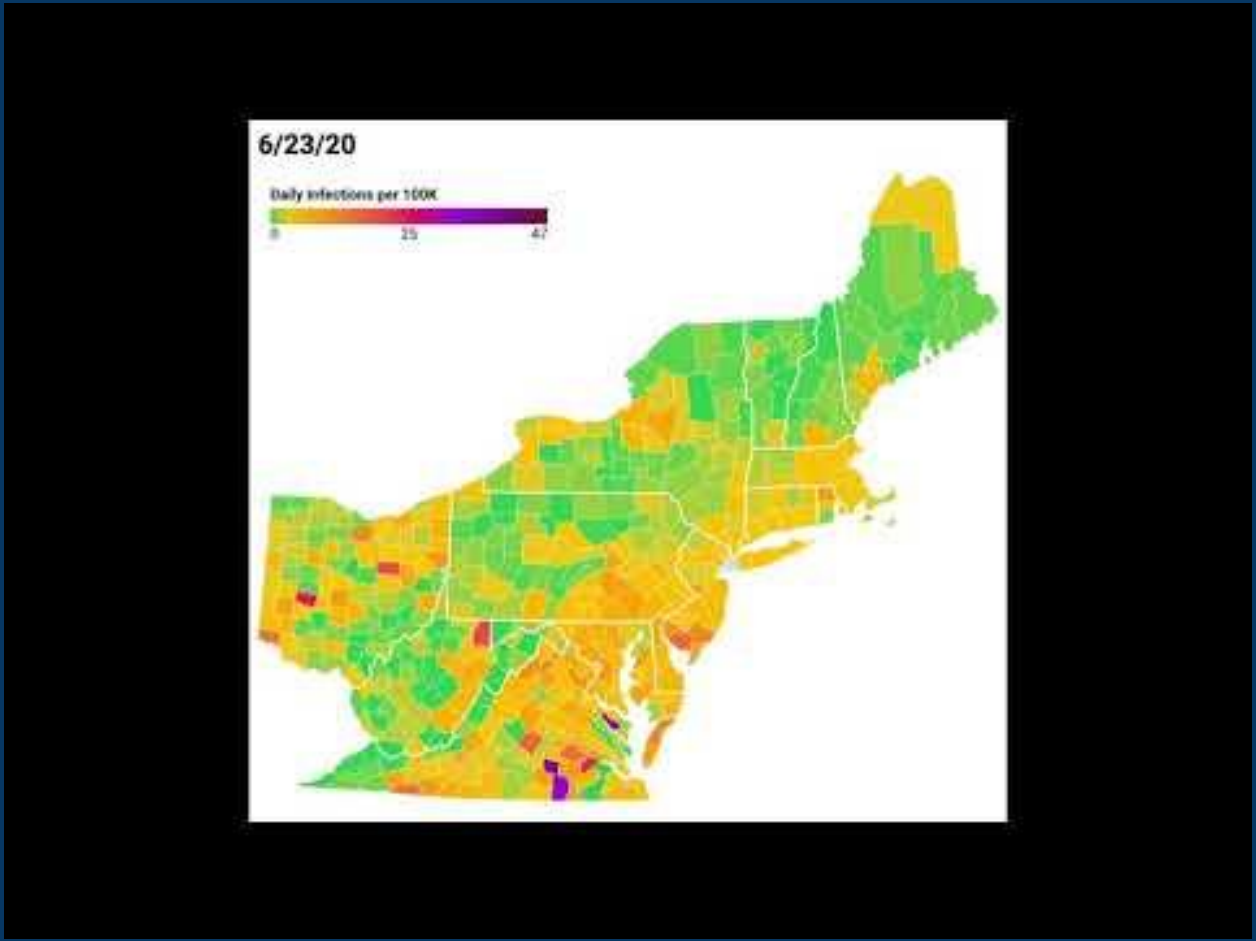
Sources: State Health Departments & CTV National News (Quebec)

Week-over-Week Northeast Case Growth Since March 16, 2020

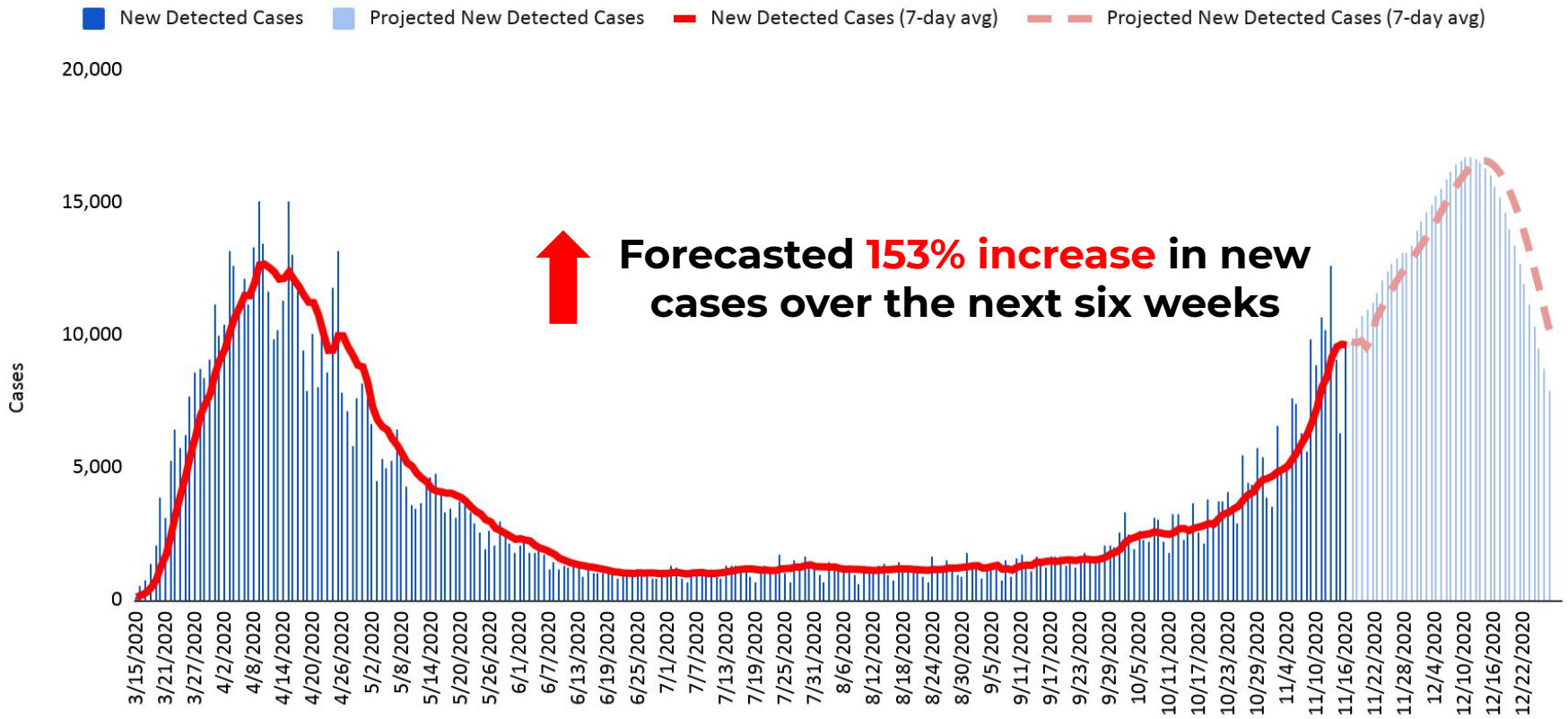


Sources: State Health Departments & CTV National News (Quebec)

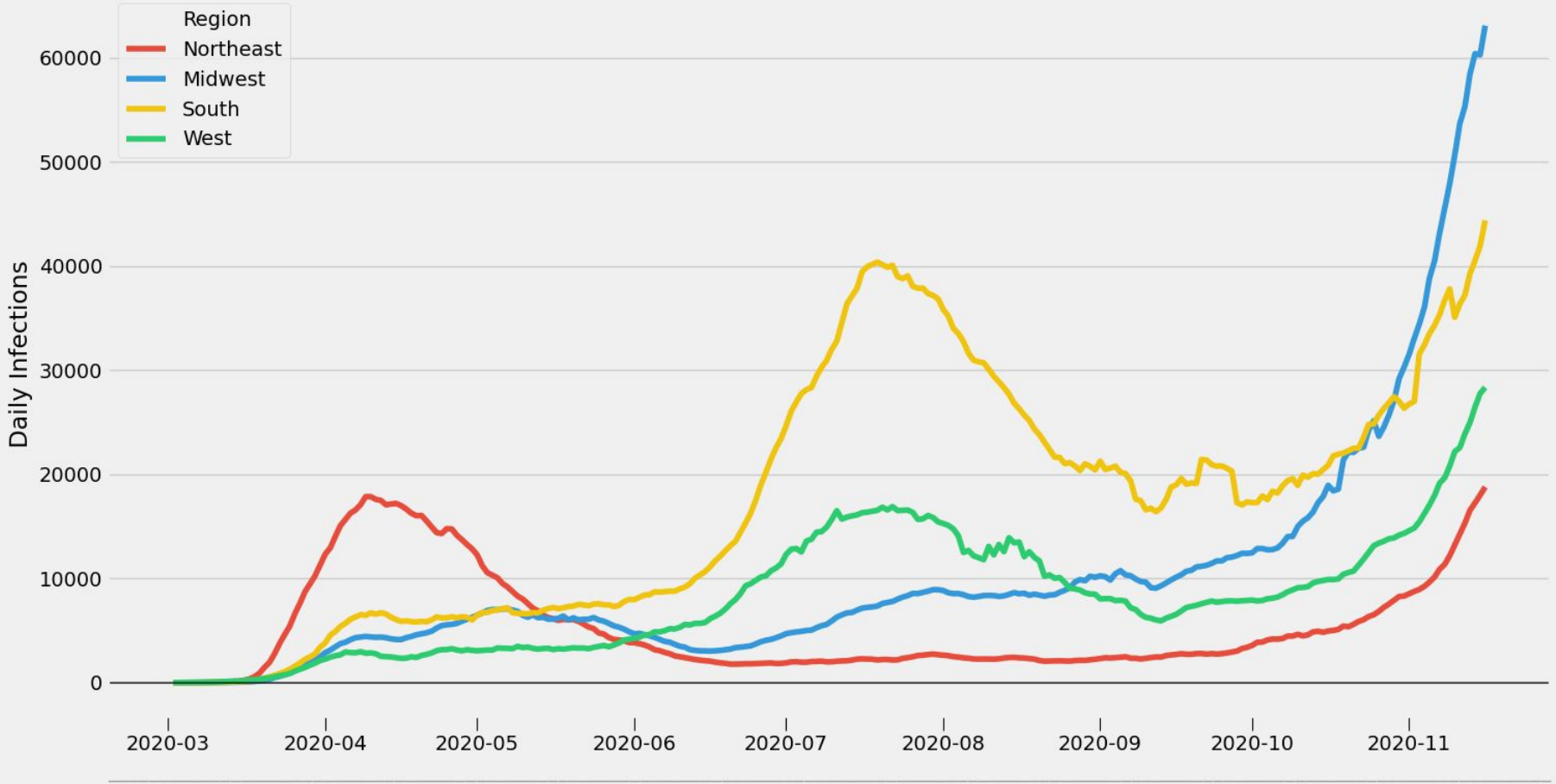
Dynamic Regional Heat Map



Northeast Forecast

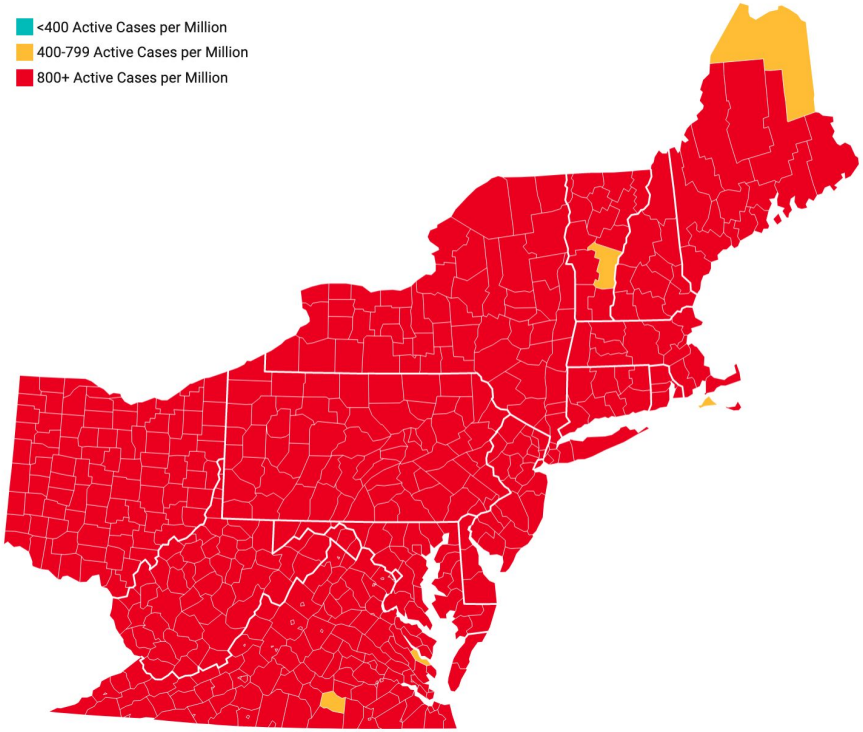


Source: Johns Hopkins University Data & Oliver Wyman Forecast Model - November 17, 2020 (New England & New York)

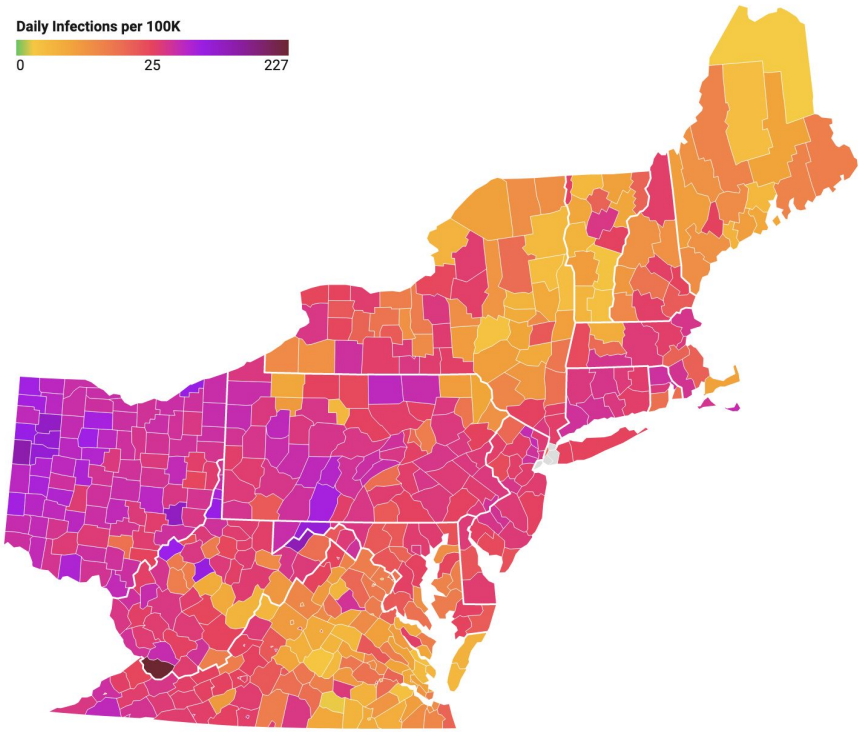

COVID-19 Daily Infections by Census Region (7-Day Moving Average)
Region
Northeast
Midwest
South
West
Daily Infections
60000
50000
40000
30000
20000
10000
0
2020-03
2020-04
2020-05
2020-06
2020-07
2020-08
2020-09
2020-10
2020-11
Source: Johns Hopkins University
11/17/2020

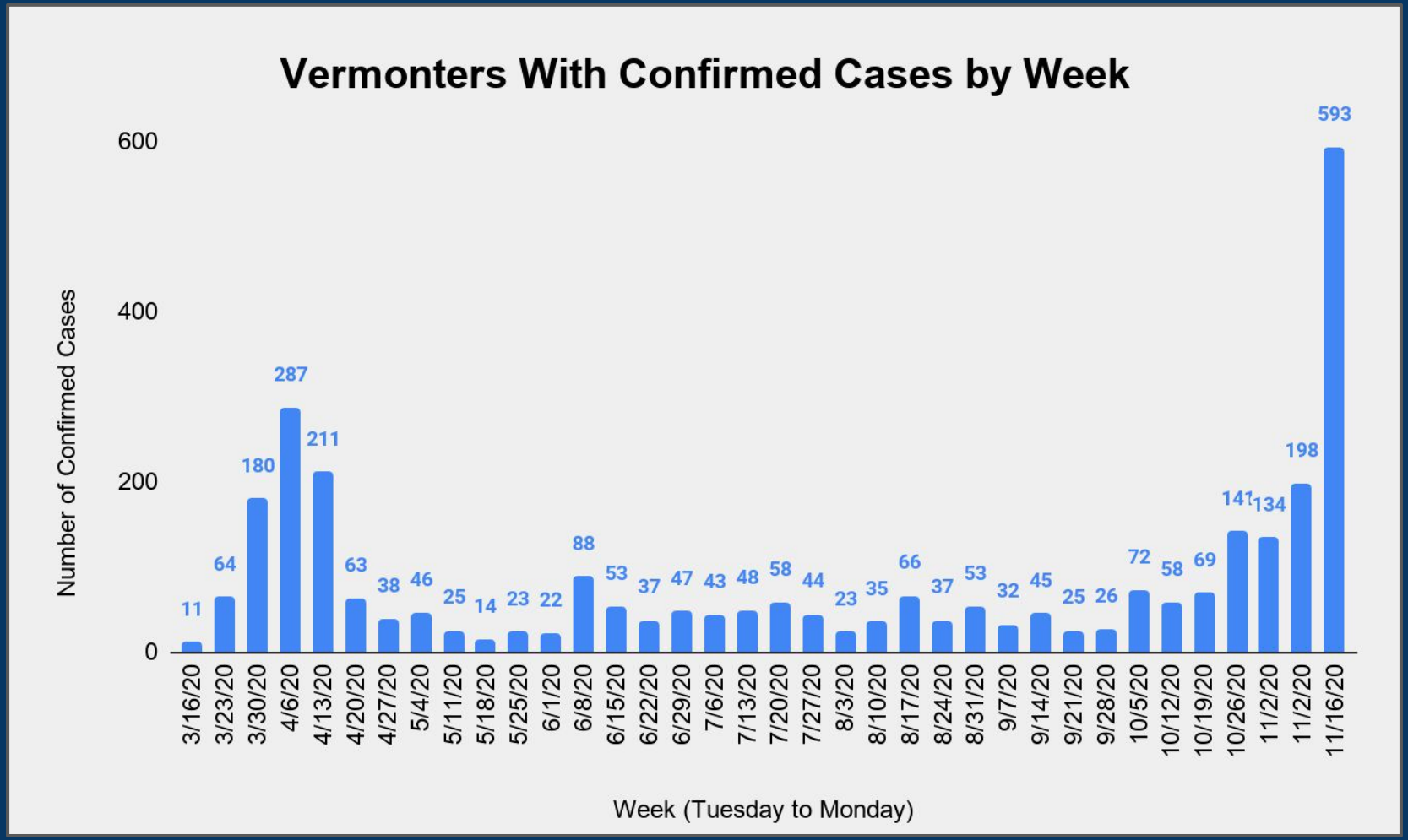
Updated Regional Map

Travel Map as of November 17

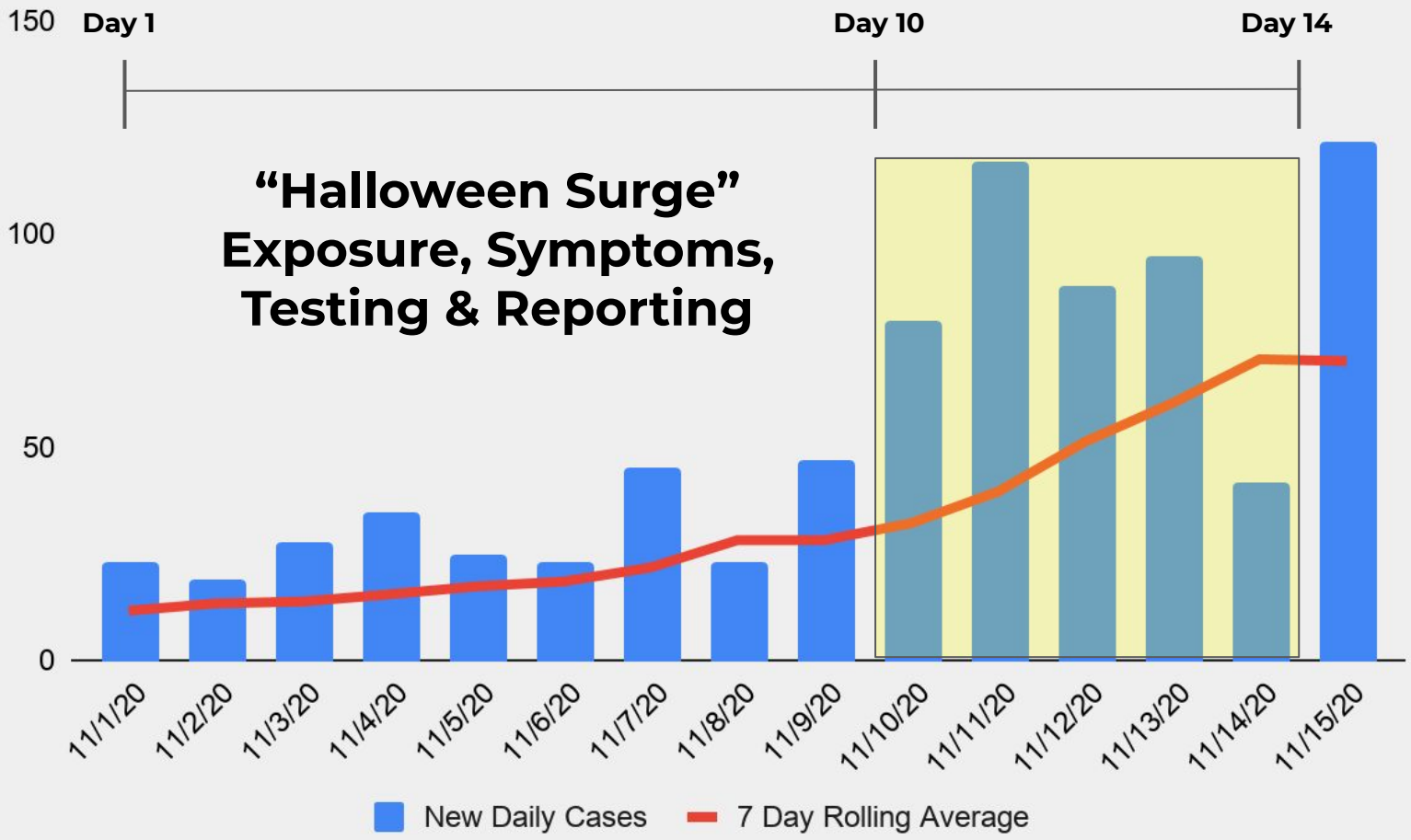


Regional Heat Map as of November 17

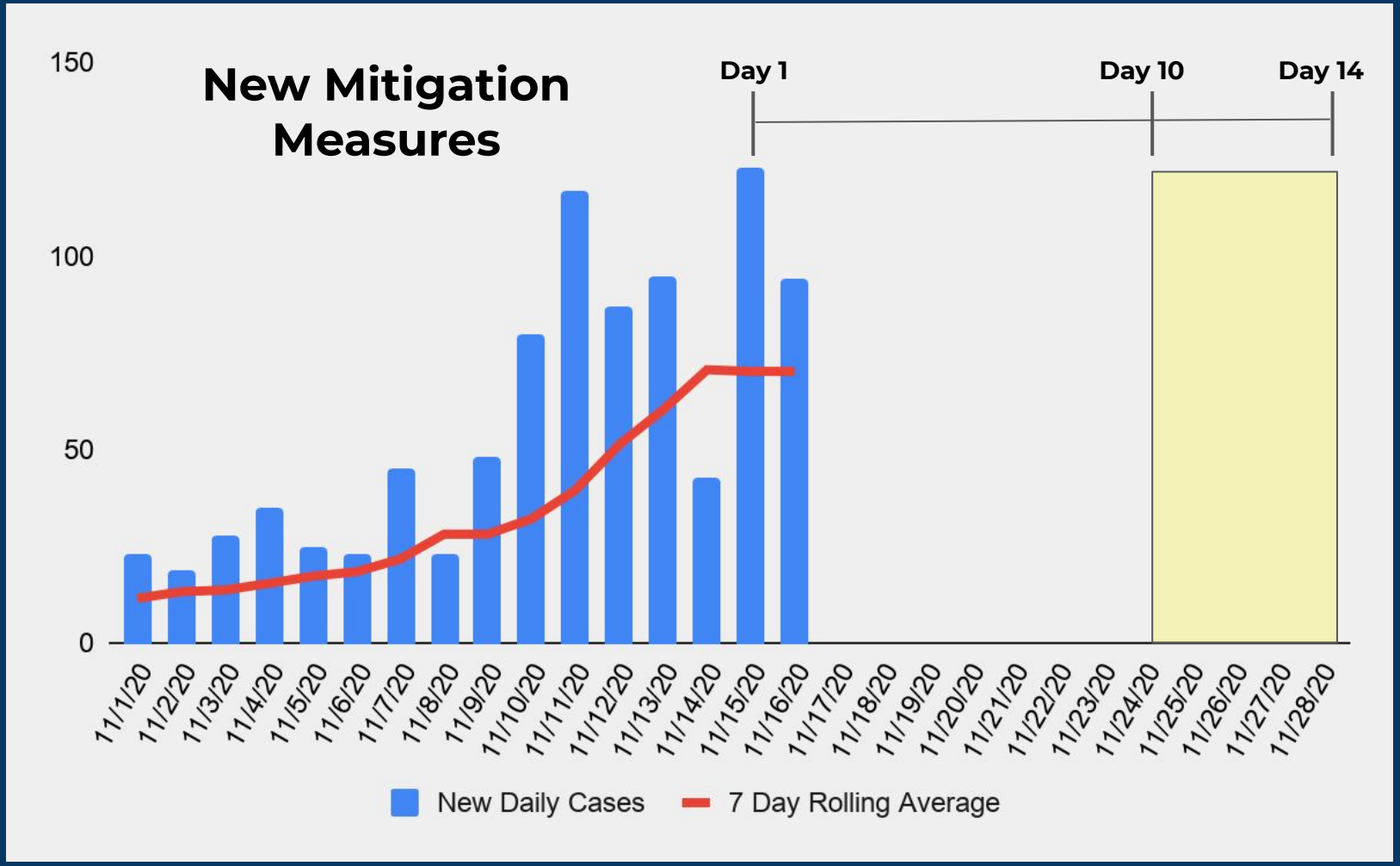


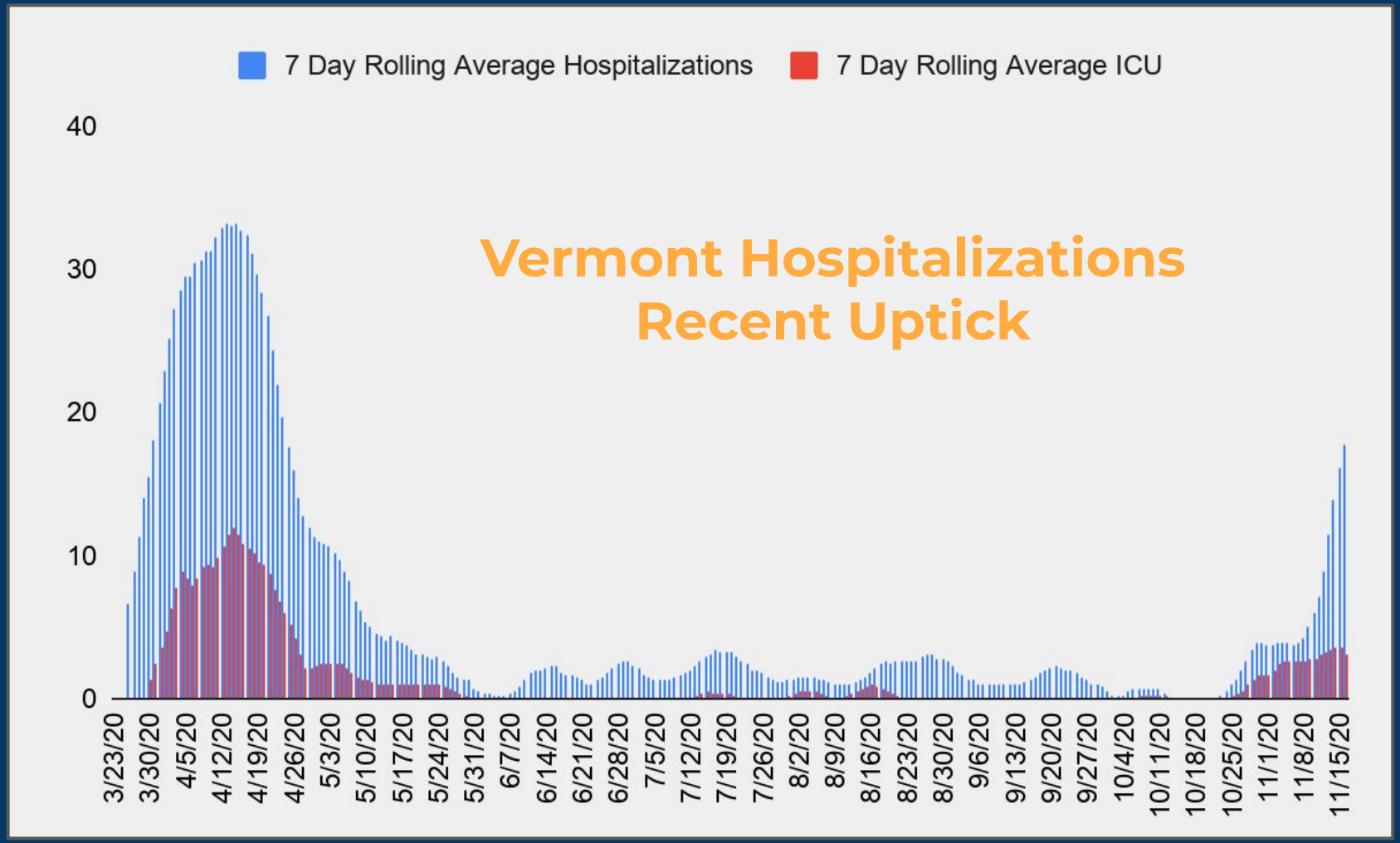


Sources: Vermont Department of Health (week calculated as Tuesday to Monday)



Source: Vermont Department of Health

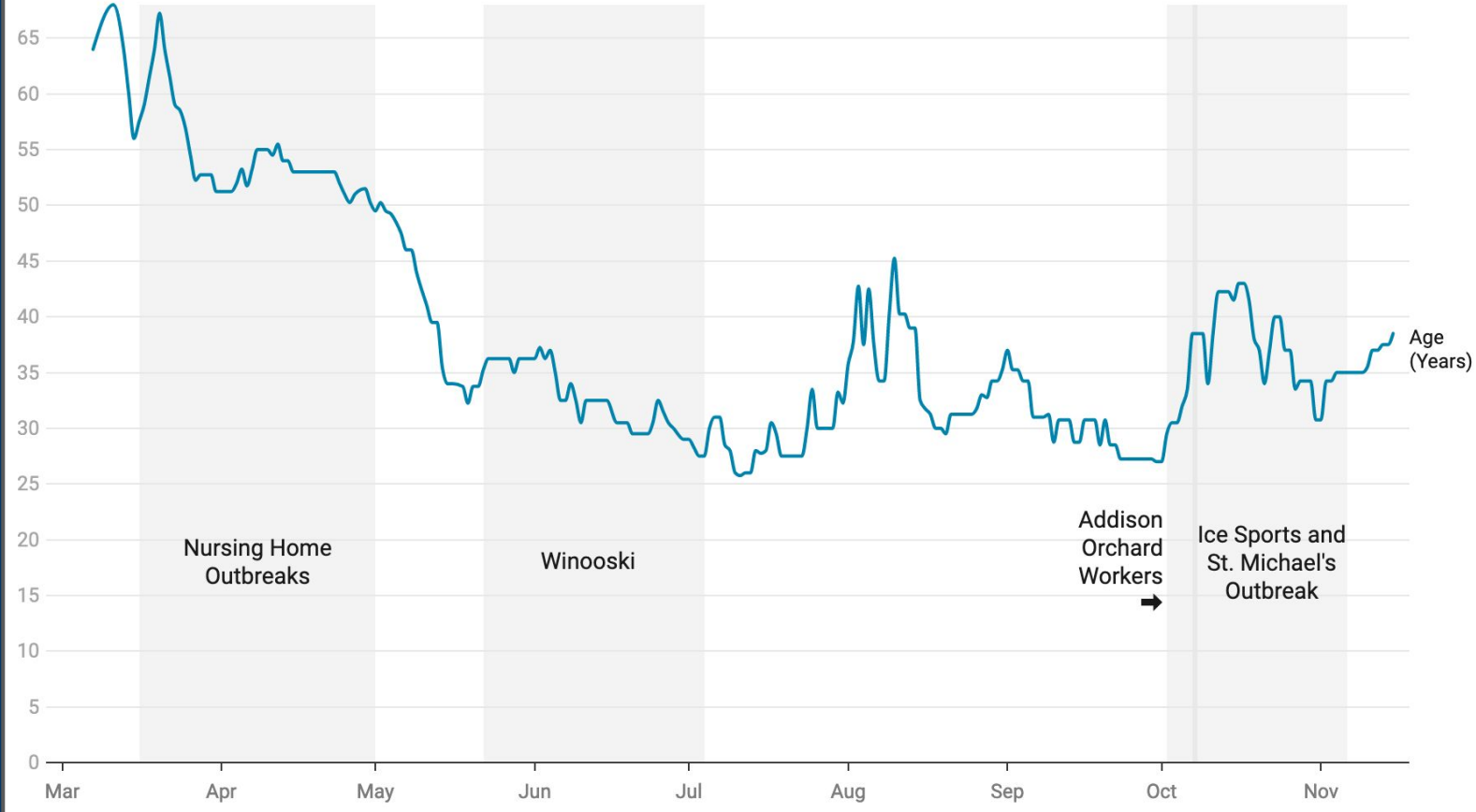

New Mitigation Measures
Day 1
Day 10
Day 14
150
100
50
0
11/1/20
11/2/20
11/3/20
11/4/20
11/5/20
11/6/20
11/7/20
11/8/20
11/9/20
11/10/20
11/11/20
11/12/20
11/13/20
11/14/20
11/15/20
11/16/20
11/17/20
11/18/20
11/19/20
11/20/20
11/21/20
11/22/20
11/23/20
11/24/20
11/25/20
11/26/20
11/27/20
11/28/20
New Daily Cases
7 Day Rolling Average



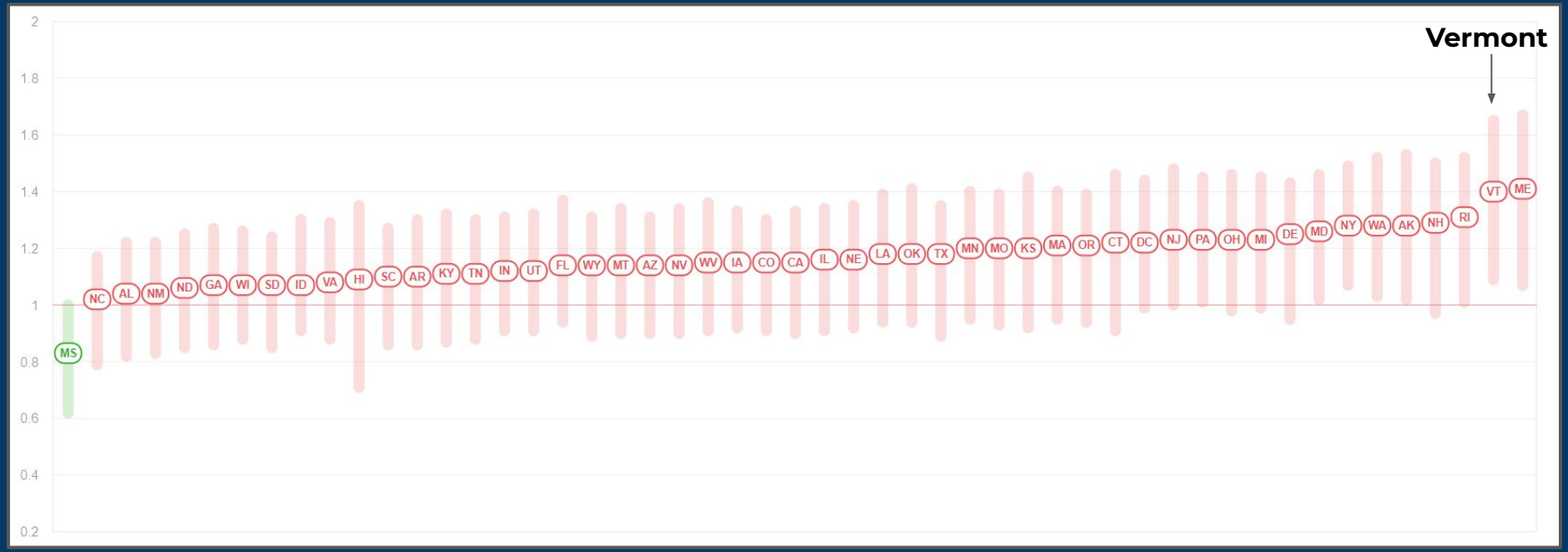
Source: Vermont Department of Health - November 9, 2020

Age of VT COVID Cases

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

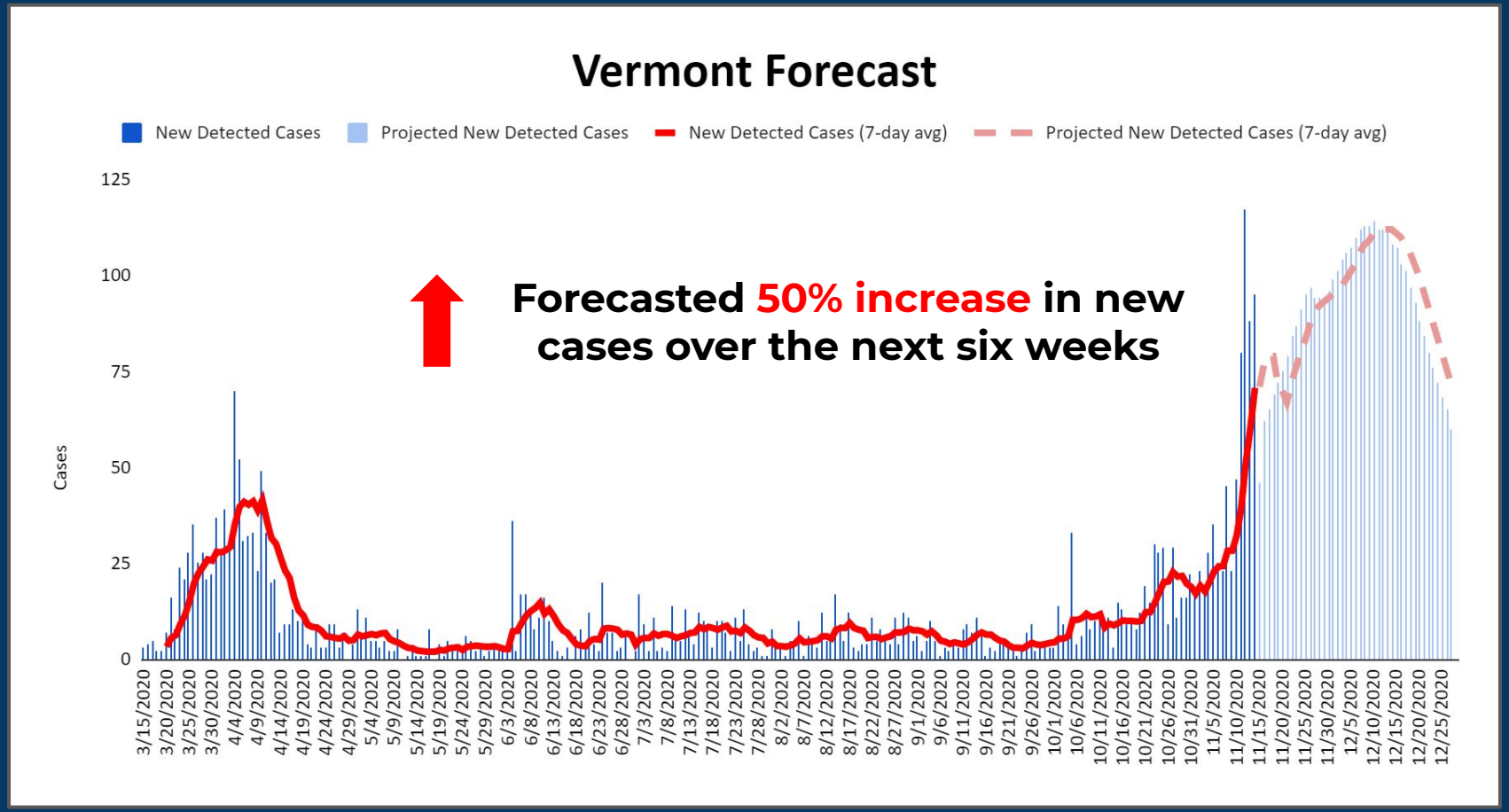


Effective Reproduction Rates Across the Country



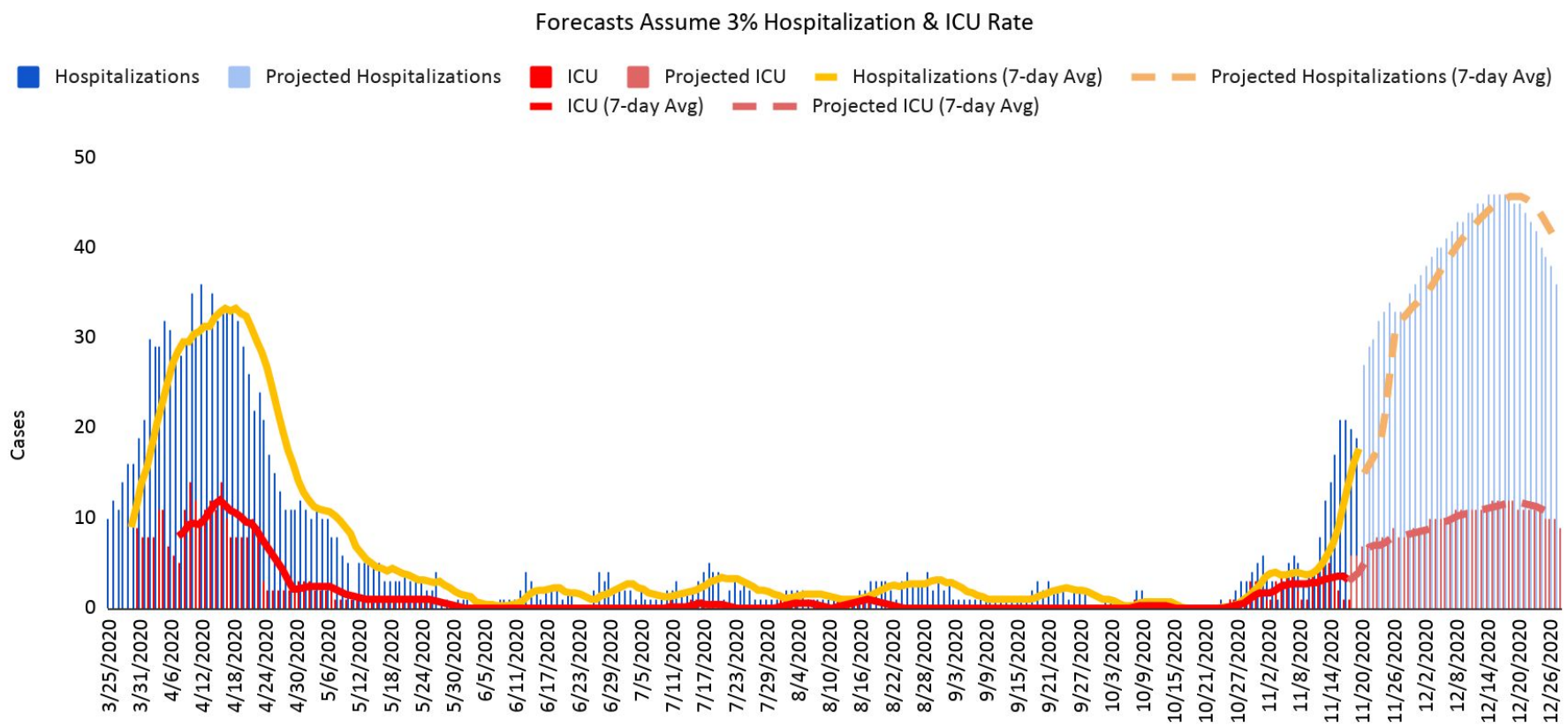
Source: Rt.live - November 16, 2020

Vermont New Case Forecast



Source: Oliver Wyman Forecast Model - November 17, 2020

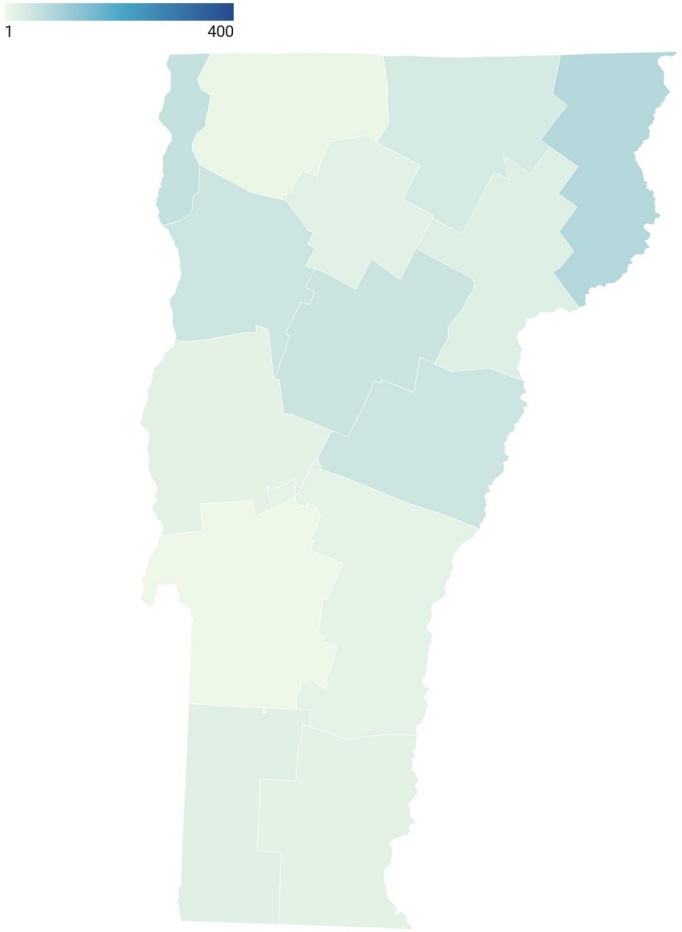
Vermont Hospital & ICU Forecast



Source: Oliver Wyman Forecast Model - November 16, 2020

Vermont Weekly Cases by County (per 100,000)

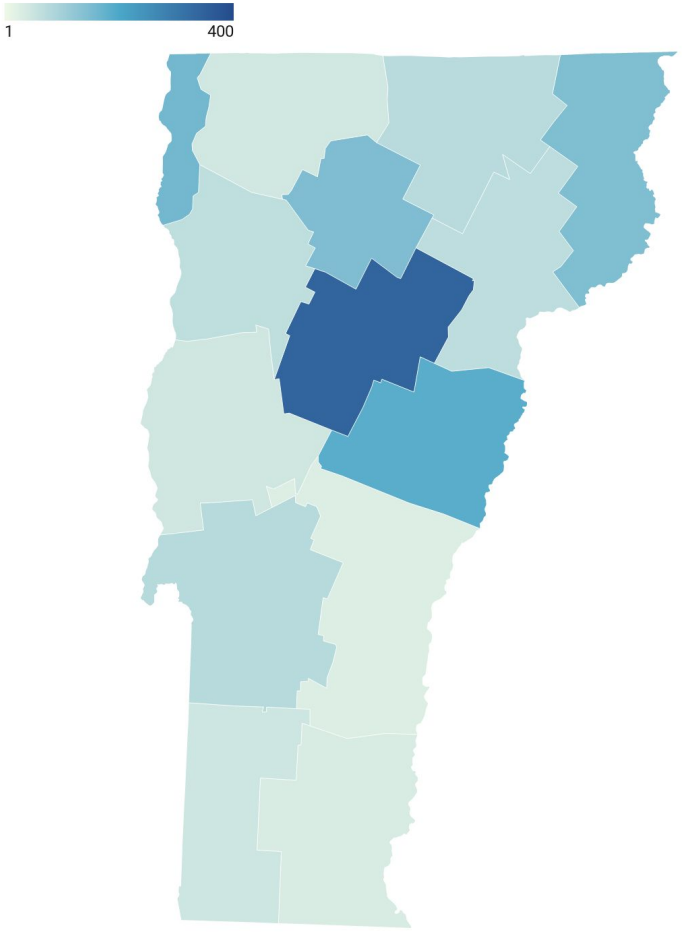
Results Reported November 3 to 9



Map: Vermont DFR COVID Modeling Team • Source: Vermont Dept. of Health • Created with Datawrapper

Vermont Weekly Cases by County (per 100,000)

Results Reported November 10 to 16



Map: Vermont DFR COVID Modeling Team • Source: Vermont Dept. of Health • Created with Datawrapper

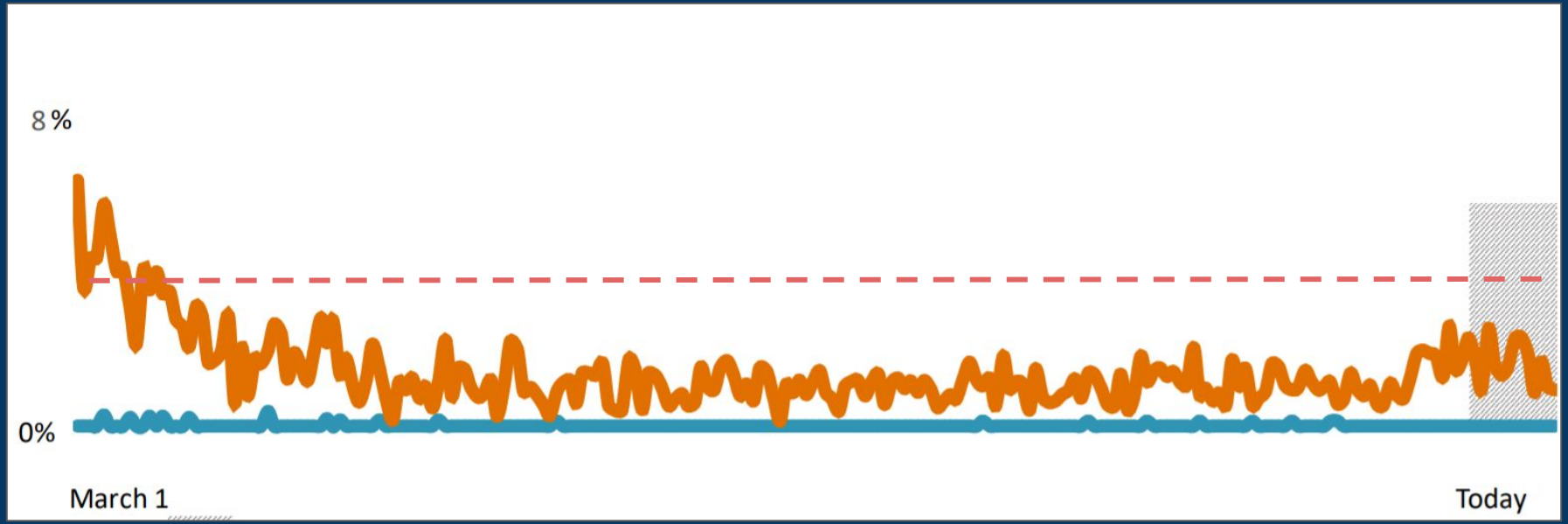
RESTART VERMONT

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

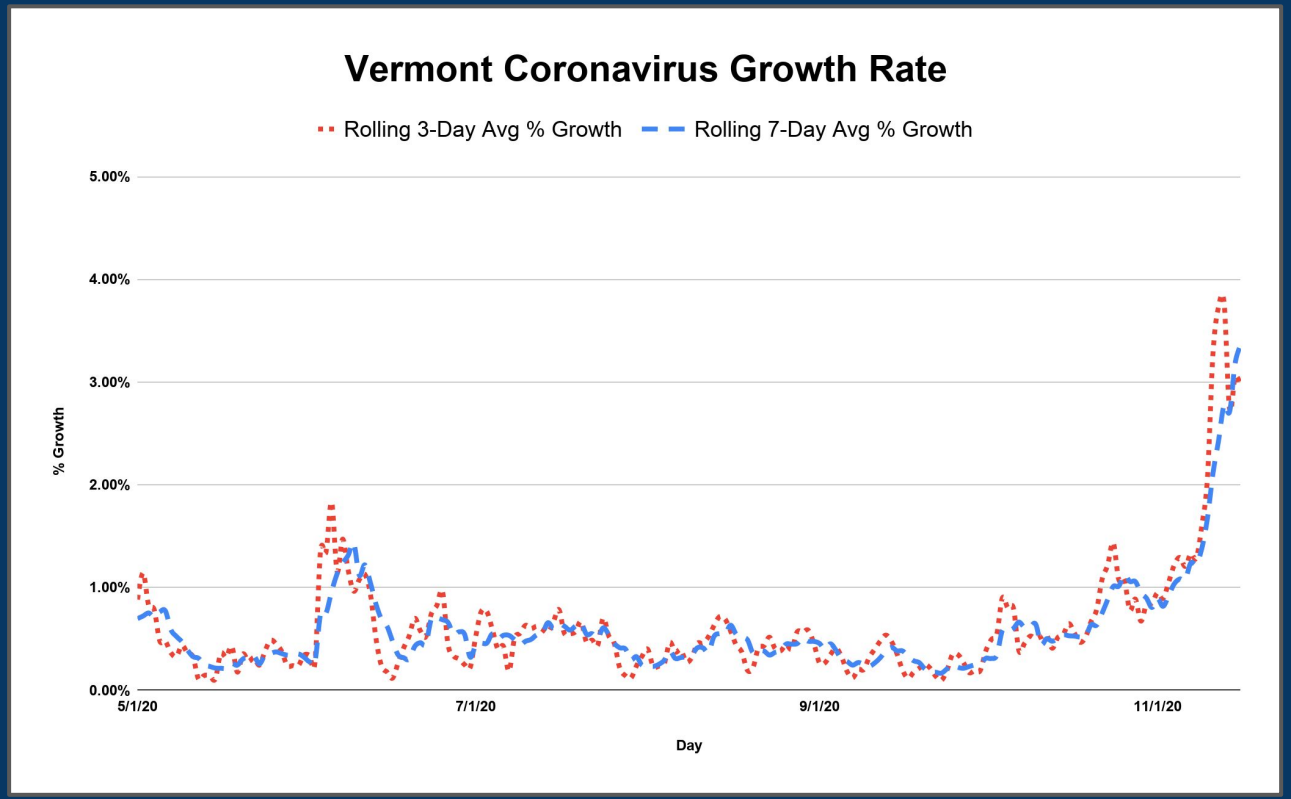


Source: Vermont Department of Health—November 17, 2020

**Data from UVMHN may be incomplete or delayed*

Data Point 2: Viral Growth and Reproductive Rates

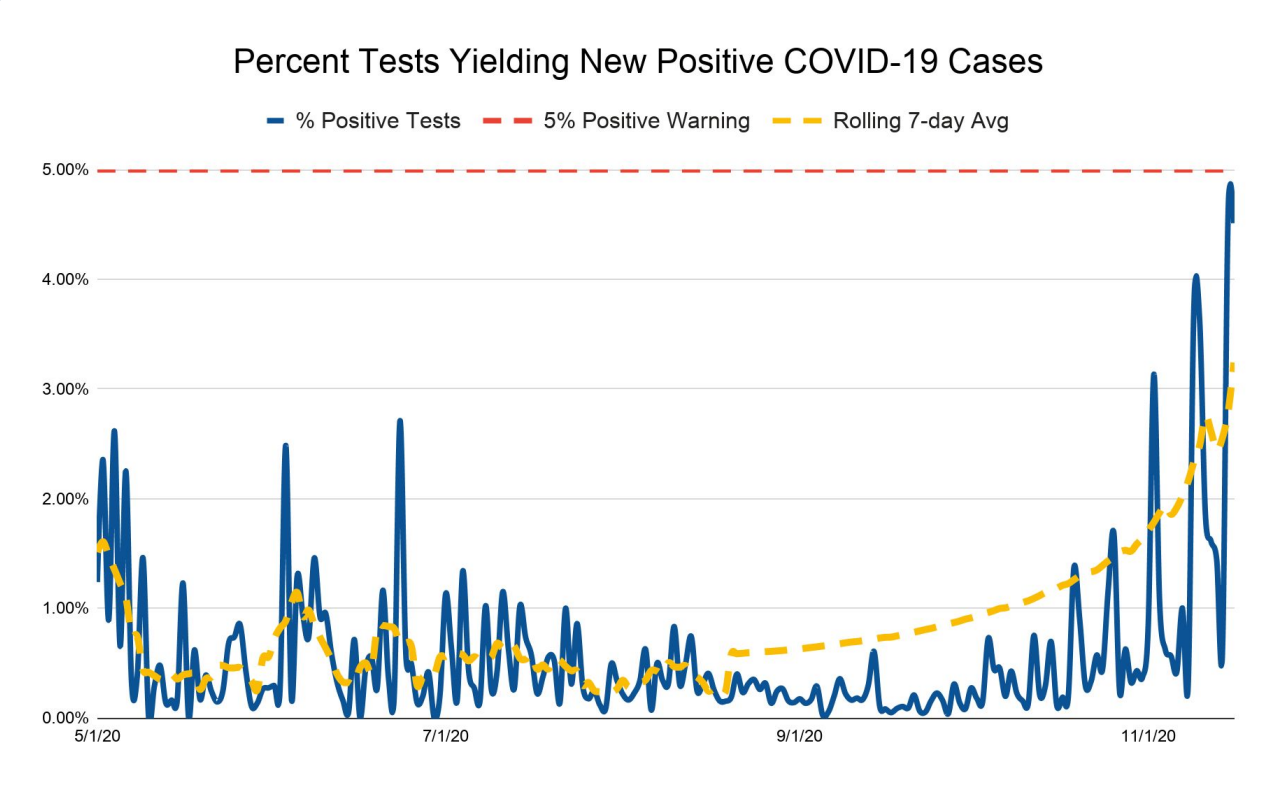
- **Summary:** Case growth measured by daily, 3-day, 7-day, and effective reproductive rate (R_t)
- **Warning Flags:** Sustained viral growth that would lead to <30% open ICU beds



Source: Vermont Department of Health—November 17, 2020

Data Point 3: Percentage of New Positive Tests

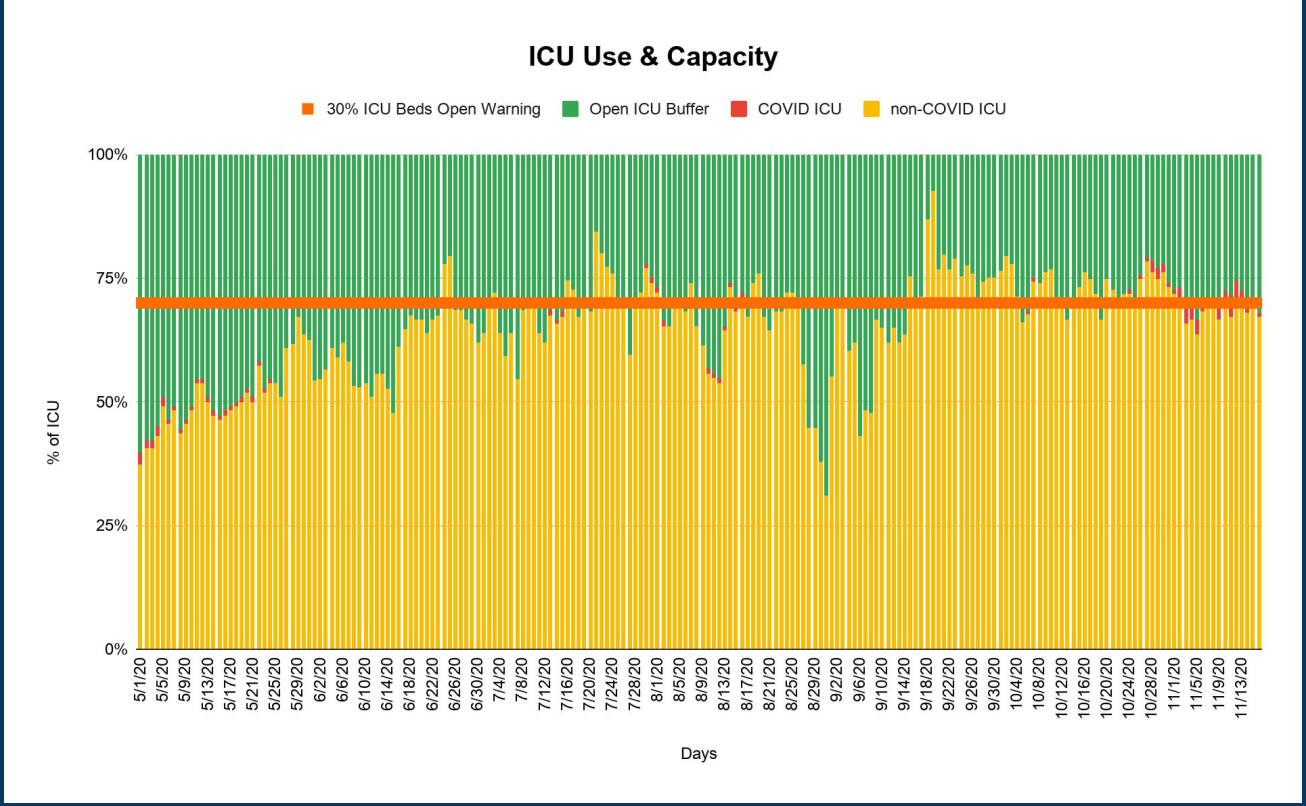
- **Summary:** Percent of tests resulting in a new positive case
- **Warning Flags:** New positives represent >5% of daily results



Source: Vermont Department of Health—November 17, 2020

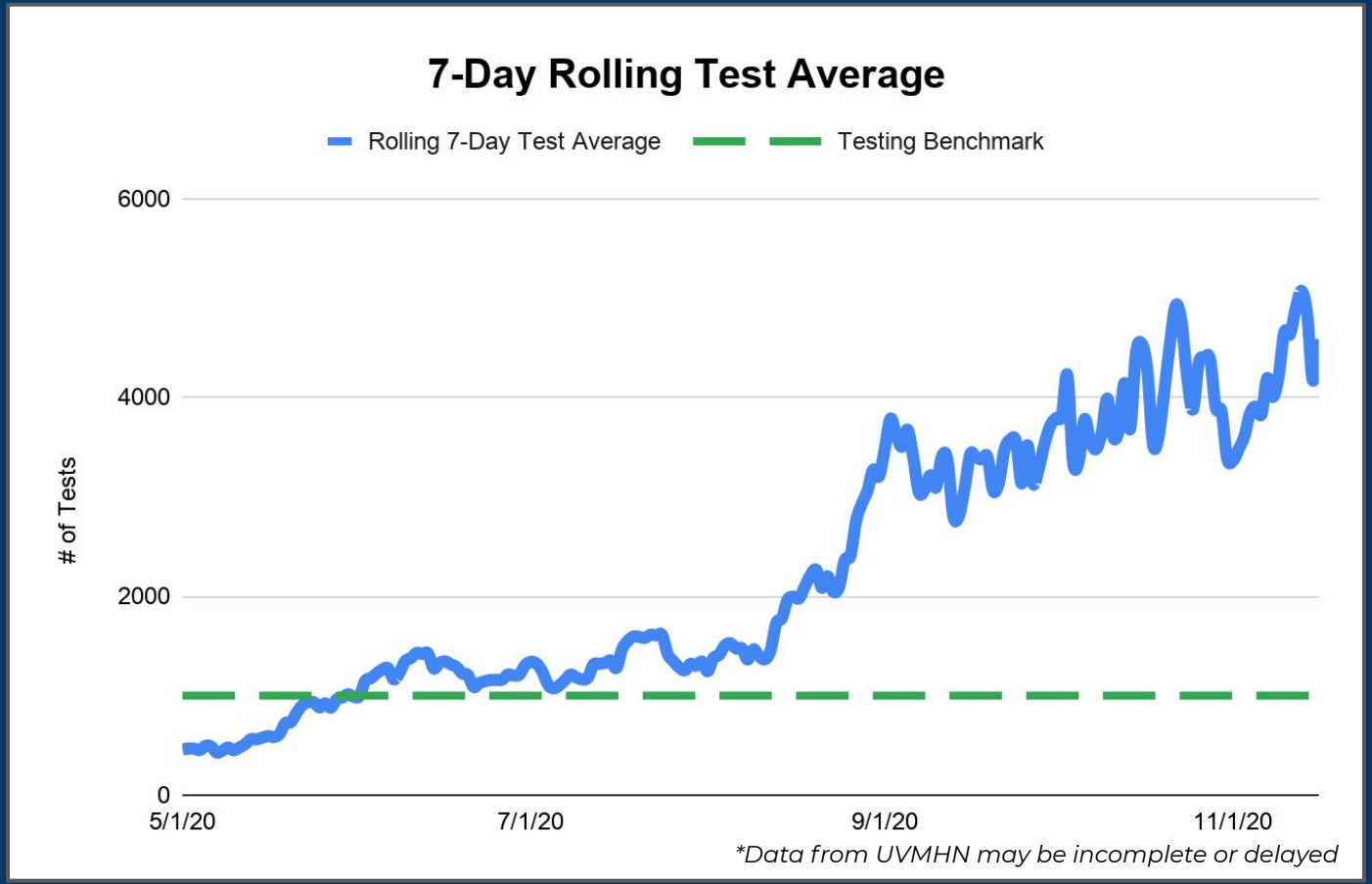
Data Point 4: Hospital & Critical Care Beds

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



Source: Vermont Department of Health—November 17, 2020

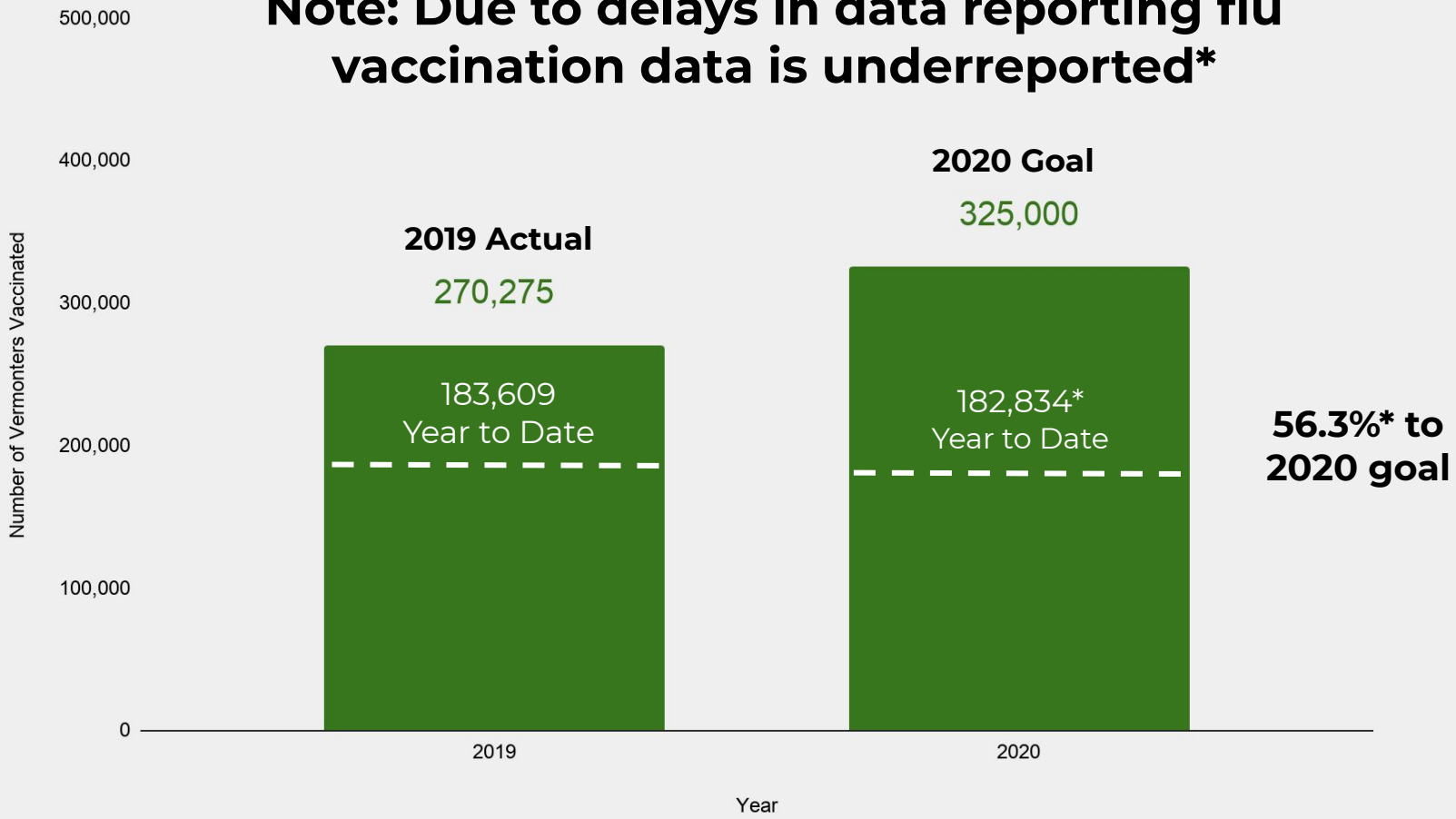
Vermont Testing



Source: Vermont Dept. of Health—November 17, 2020; results reported to VDH daily

Vermont Flu Vaccine Data

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



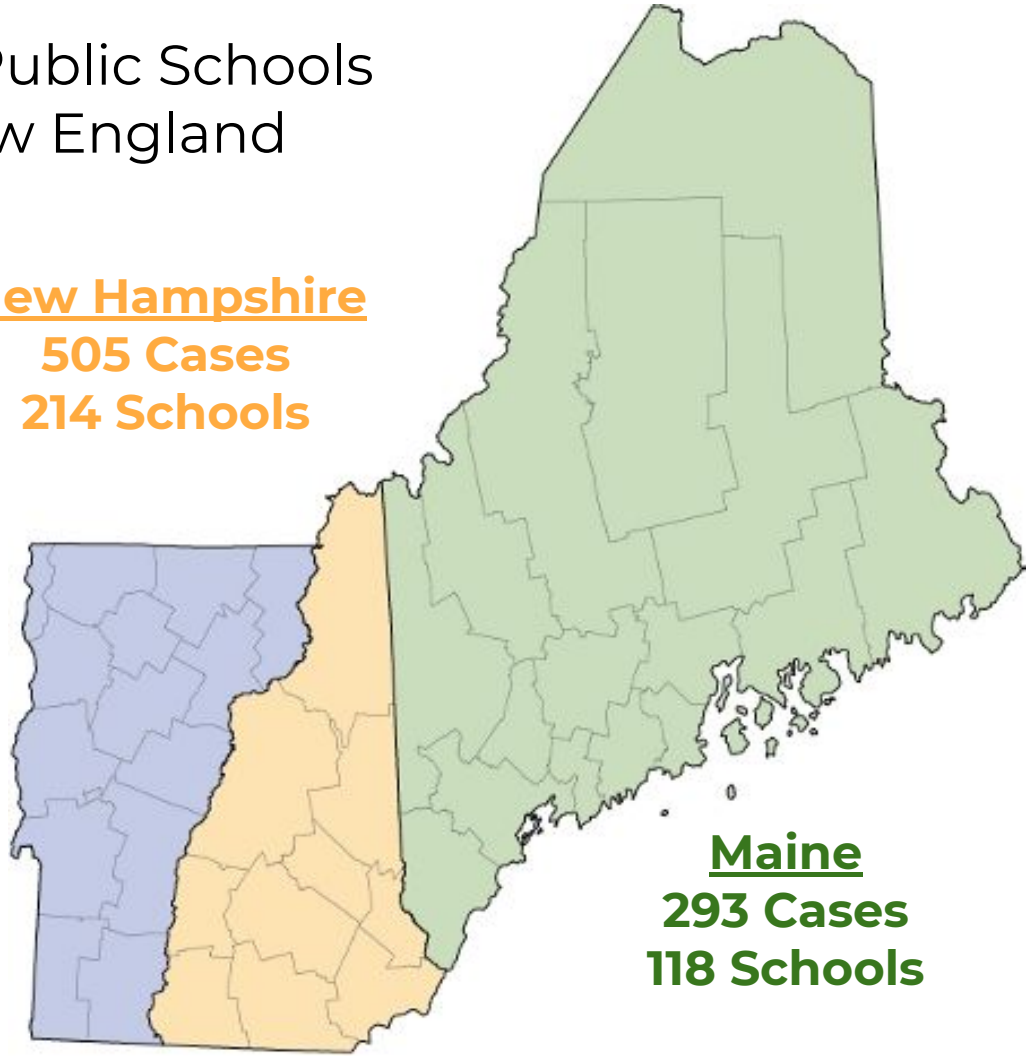
Data from UVMHN incomplete or delayed; additional batch delays

Source: Vermont Department of Health & ADS; Immunization Registry; Measured from July 1 to November 8, 2019 & 2020

K-12 & Higher Education Update

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

New Hampshire
505 Cases
214 Schools



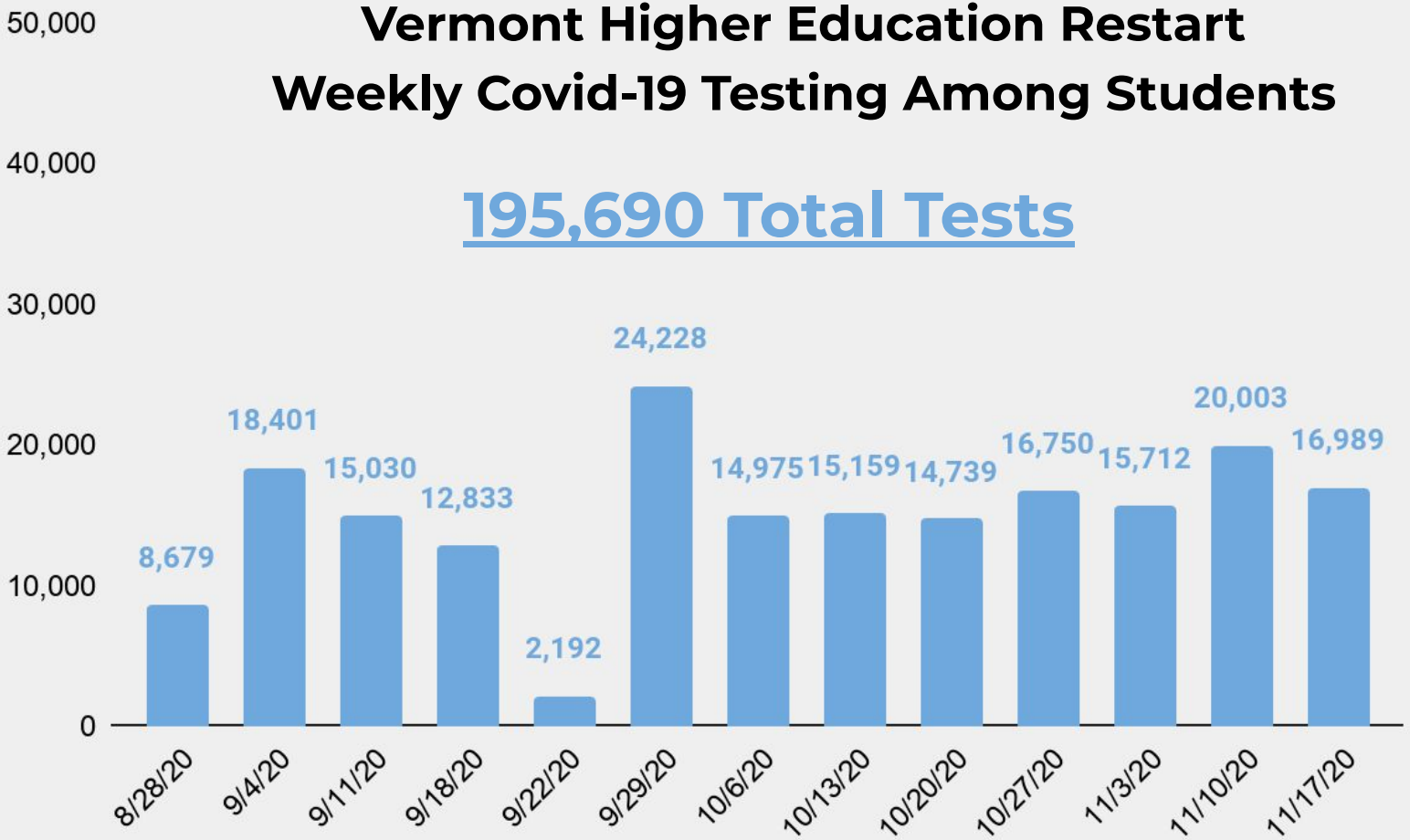
Vermont
74 Cases
53 Schools

Maine
293 Cases
118 Schools

Source: VT, NH and ME K-12 Dashboards

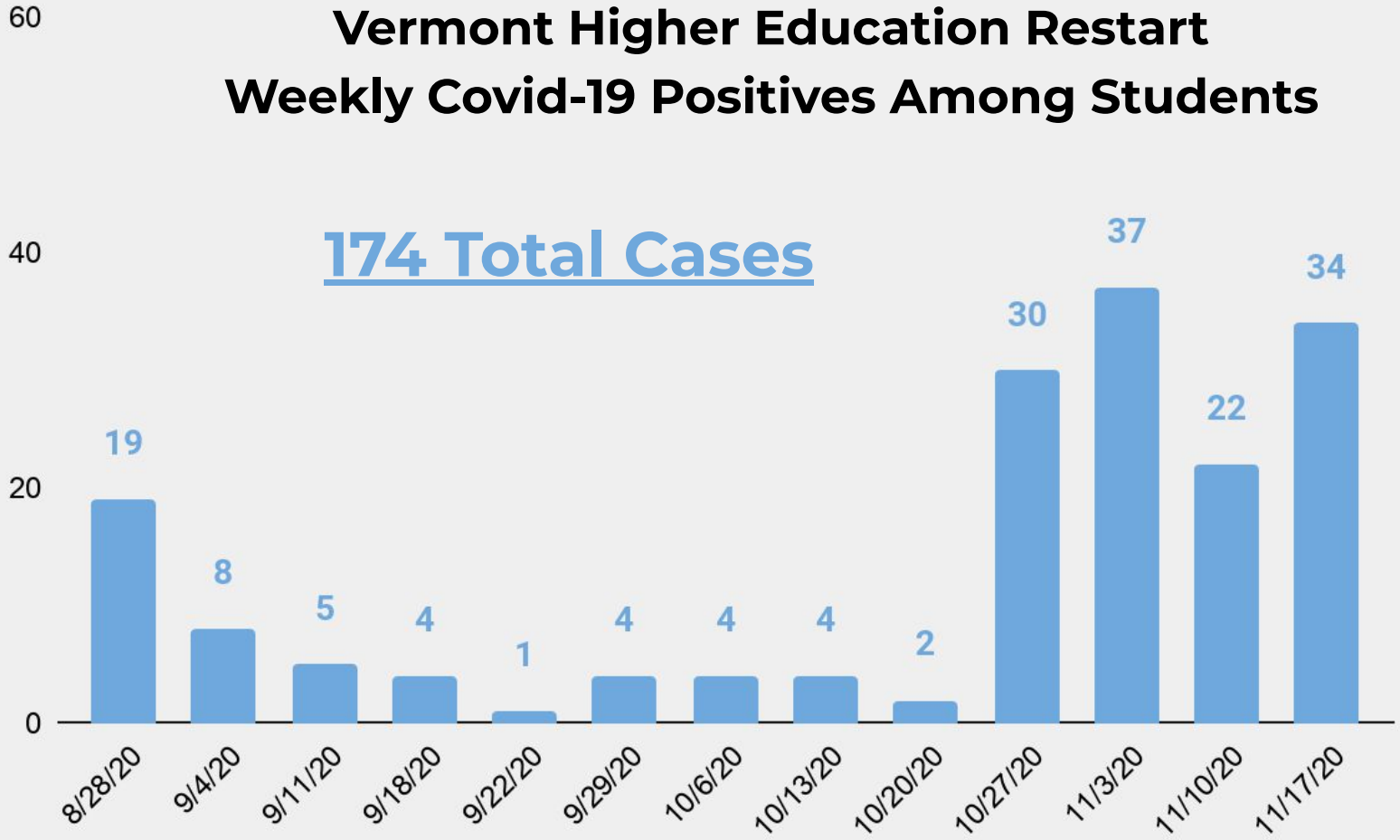
Vermont Higher Education Restart
Weekly Covid-19 Testing Among Students

195,690 Total Tests



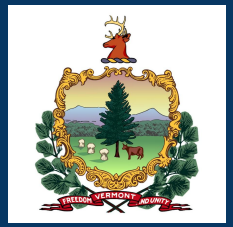
Source: Vermont Colleges and Universities (presentation switched to Tuesday on September 22, 2020)

Vermont Higher Education Restart
Weekly Covid-19 Positives Among Students



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*		404,886	584	0.14%
Maine*		132,724	158	0.12%
Vermont		195,690	174	0.09%

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

Vermont Higher Education Restart
Institution Data as of November 17, 2020

College / University	Total Tests	Student Positives	Employee Positives	Dashboard / Public Information
Middlebury College	11,957	2	2	https://www.middlebury.edu/office/midd2021/covid-reporting-dashboard
University of Vermont	127,122	61	10	https://www.uvm.edu/returntocampus/uvm-weekly-testing-report
Norwich University	15,109	10	1	https://www.norwich.edu/news/psa
Northern Vermont University	4,732	5	1	https://www.northernvermont.edu/nvu-during-covid-19
Castleton University	1,398	2	0	https://www.castleton.edu/covid-19-coronavirus-updates/covid-19-test-results/
Vermont Technical College	550	4	1	https://www.vtc.edu/update-on-the-covid-19-coronavirus/
Saint Michael's College	8,750	79	0	https://www.smcvt.edu/return-to-campus/
Sterling College	212	0	0	https://sterlingcollege.edu/coronavirus-2019/
Champlain College	16,789	5	0	https://view.champlain.edu/champlain-college-covid-19-testing-dashboard/
Bennington College	6,403	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 facilitites
Landmark College	2,352	2	2	https://www.landmark.edu/student-life/health-counseling-wellness/covid-19/covid-19-dashboard
Albany College of Pharmacy	144	1	0	https://www.acphs.edu/health-safety
Totals	195,690	174	17	

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