COVID-19 Modeling
September 29, 2020

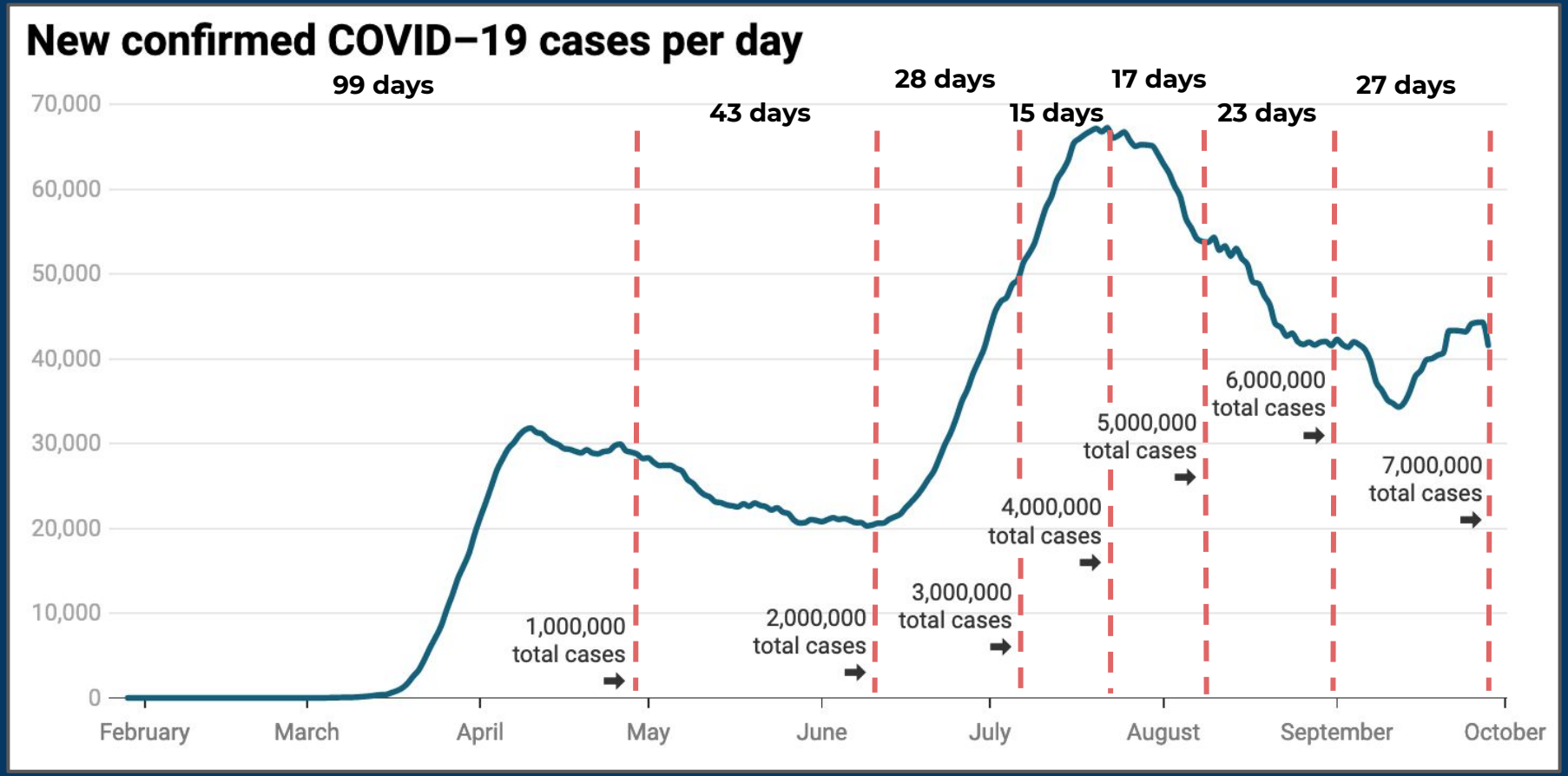
Presentation available at:
dfr.vermont.gov

1,000,000+

Covid-19 Deaths World Wide

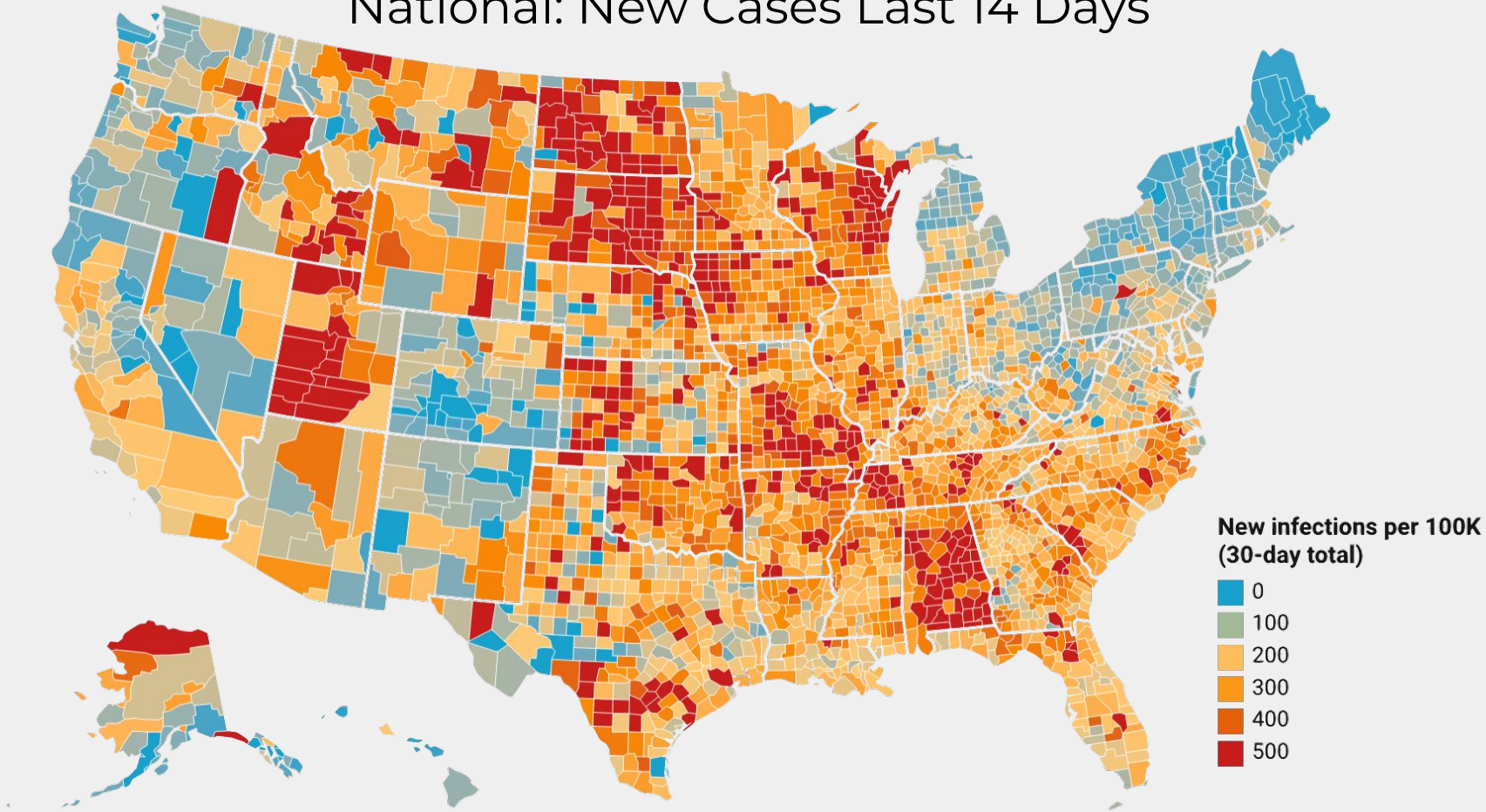
Source: Johns Hopkins University—September 28, 2020

National Data

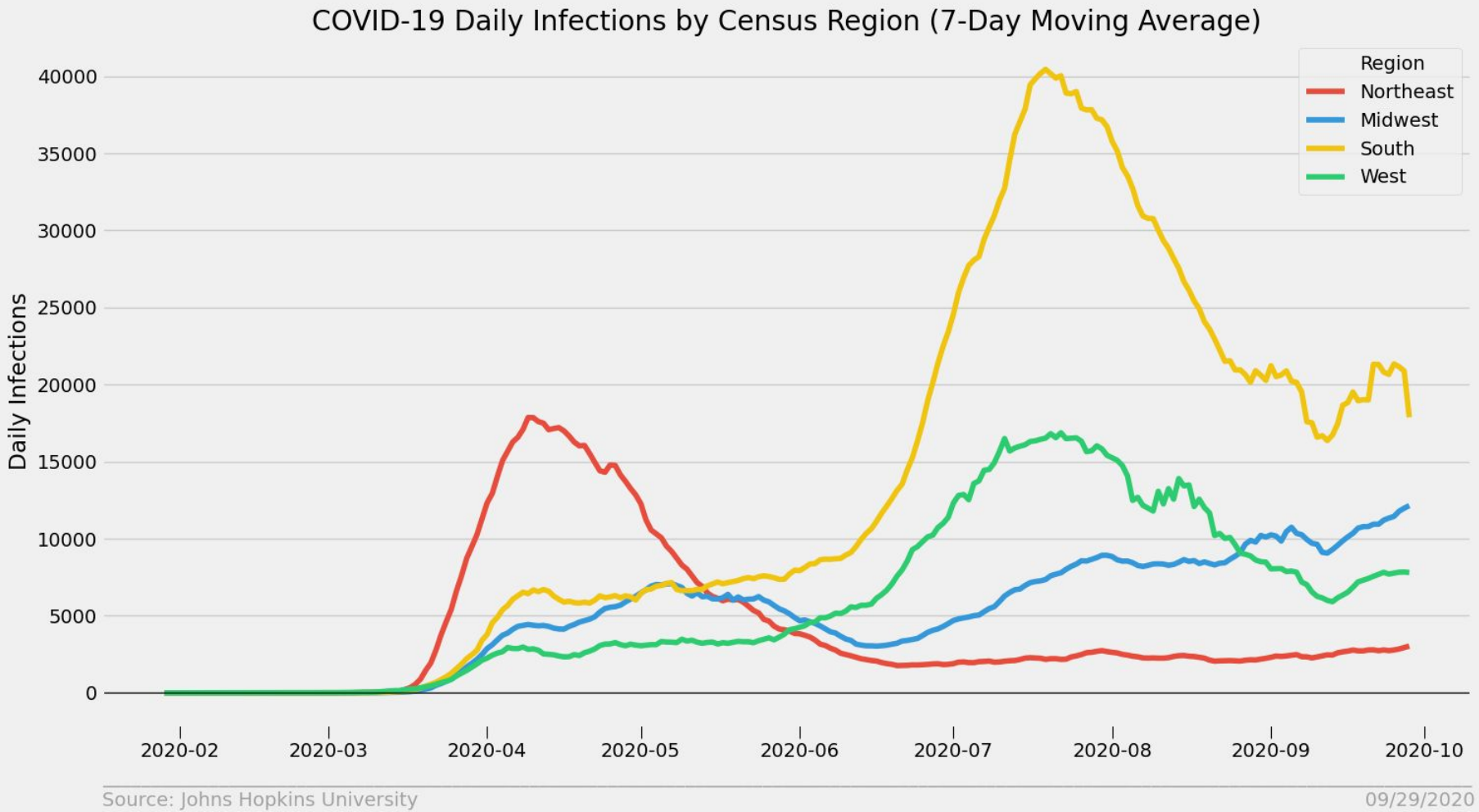


Source: Johns Hopkins University - September 28, 2020

National: New Cases Last 14 Days

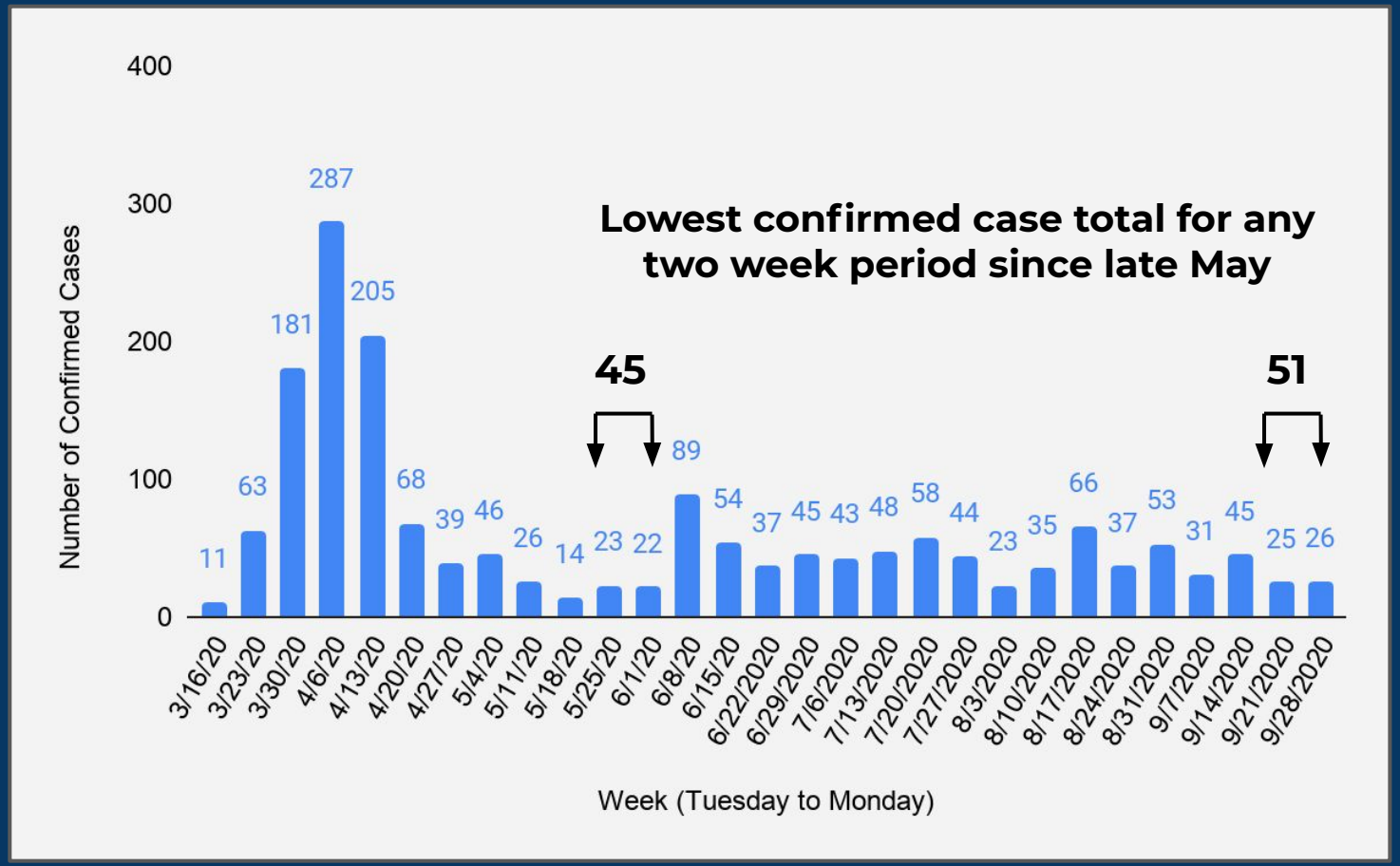


Source: Raw data from Johns Hopkins University—September 29, 2020


COVID-19 Daily Infections by Census Region (7-Day Moving Average)
Daily Infections
40000
35000
30000
25000
20000
15000
10000
5000
0
2020-02
2020-03
2020-04
2020-05
2020-06
2020-07
2020-08
2020-09
2020-10
Region
Northeast
Midwest
South
West
Source: Johns Hopkins University
09/29/2020

Vermont Data

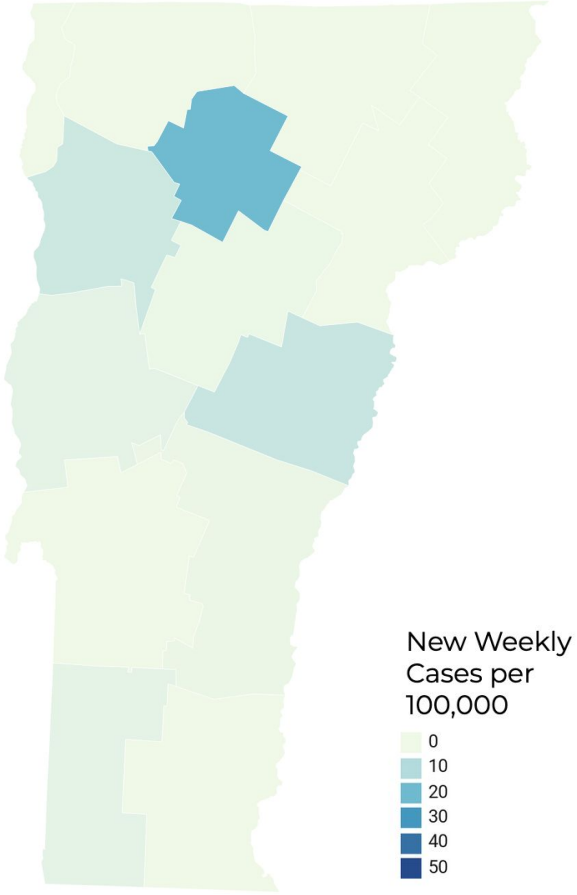
Vermont Weekly Totals



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

Vermont Weekly Cases by County (per 100,000)

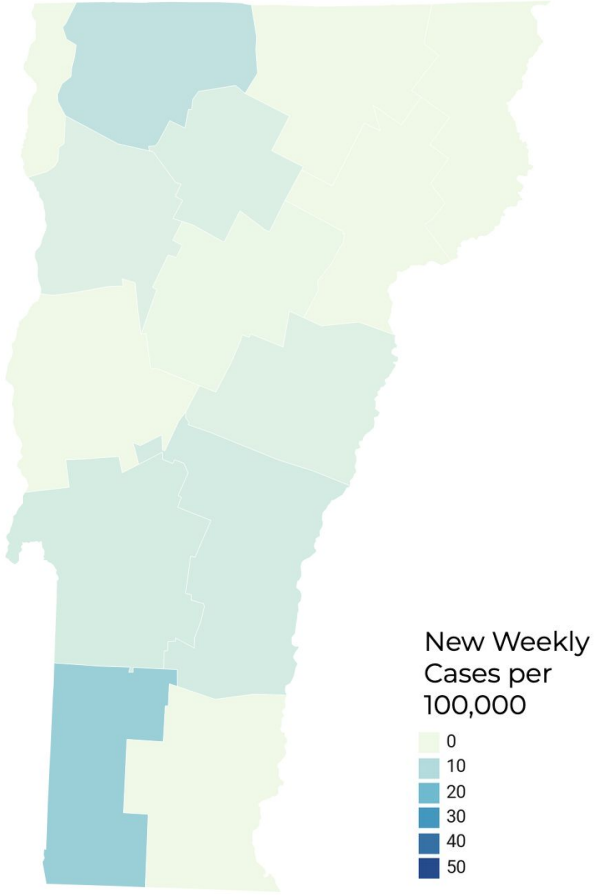
Results Reported September 15 to 21



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

Vermont Weekly Cases by County (per 100,000)

Results Reported September 22 to 28



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

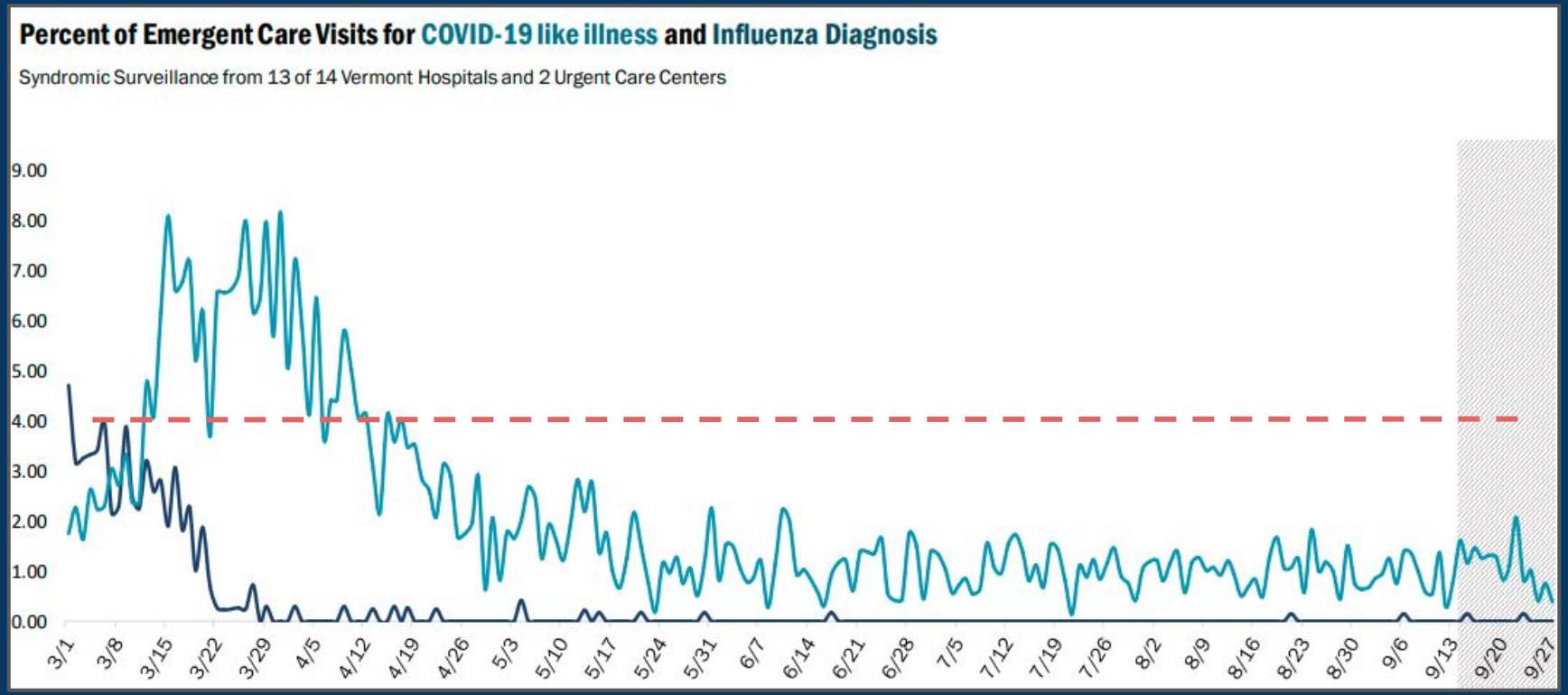
RESTART VERMONT

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

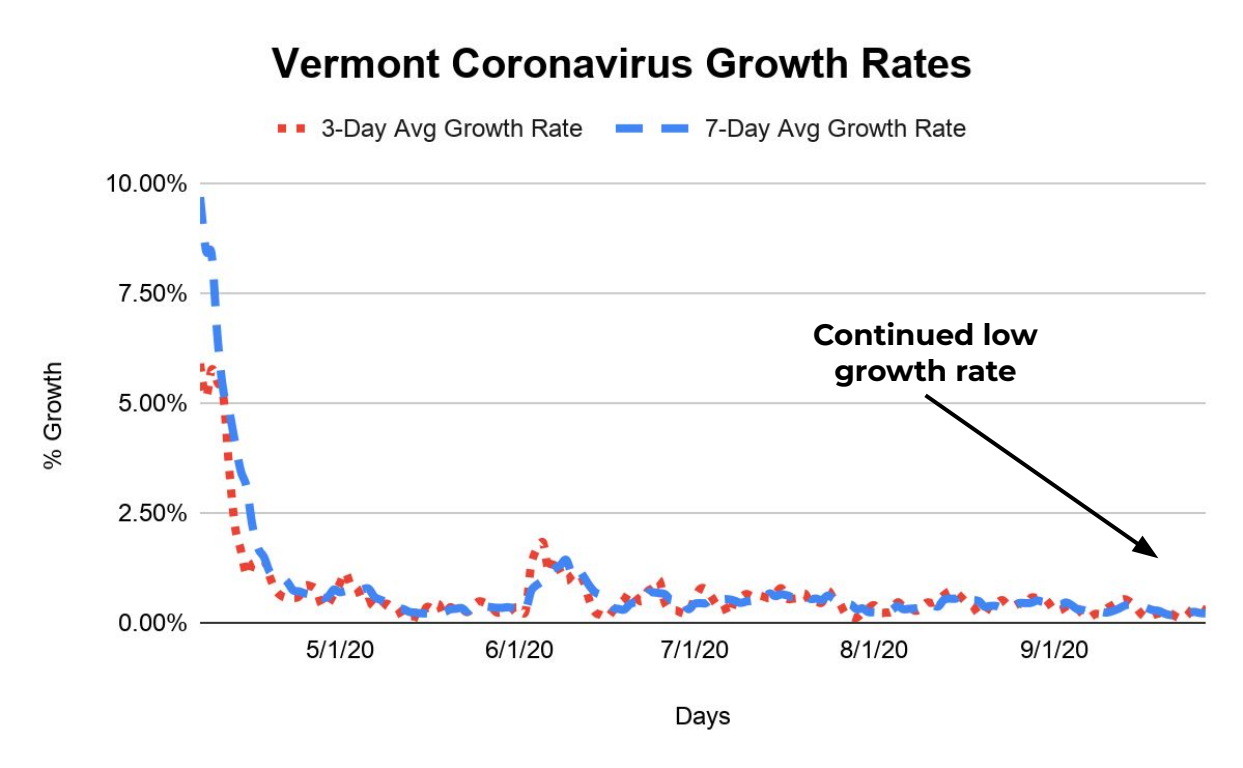
- **Summary:** Percentage of visits with COVID-19 like illness and Influenza diagnosis
- **Warning Flag:** Percentage of visits exceeding 4% for multiple consecutive days



Source: Vermont Department of Health - September 28, 2020

Data Point 2: Viral Growth and Reproductive Rates

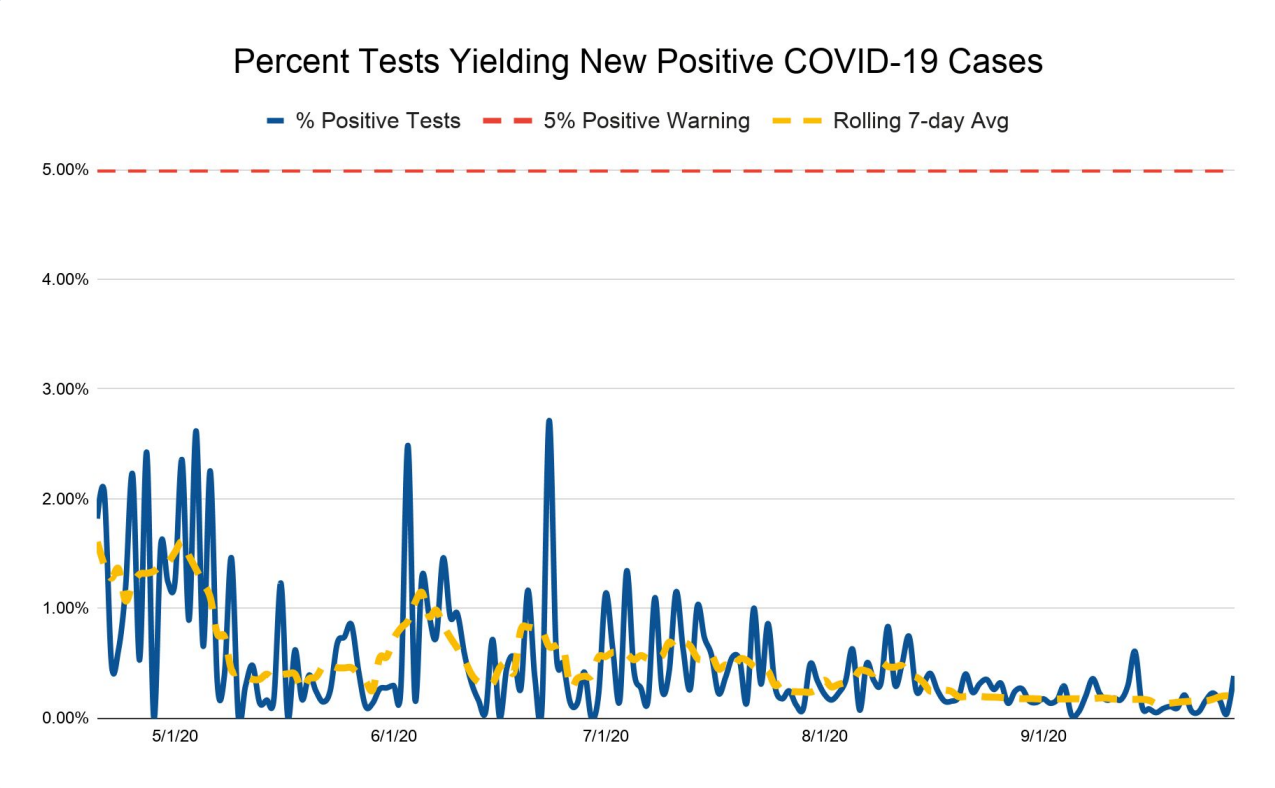
- **Summary:** Case growth measured by daily, 3-day, 7-day, and effective reproductive rate (R_t)
- **Warning Flags:** Sustained viral growth that would lead to <30% of open ICU beds



Source: Vermont Department of Health - September 28, 2020

Data Point 3: Percentage of New Positive Tests

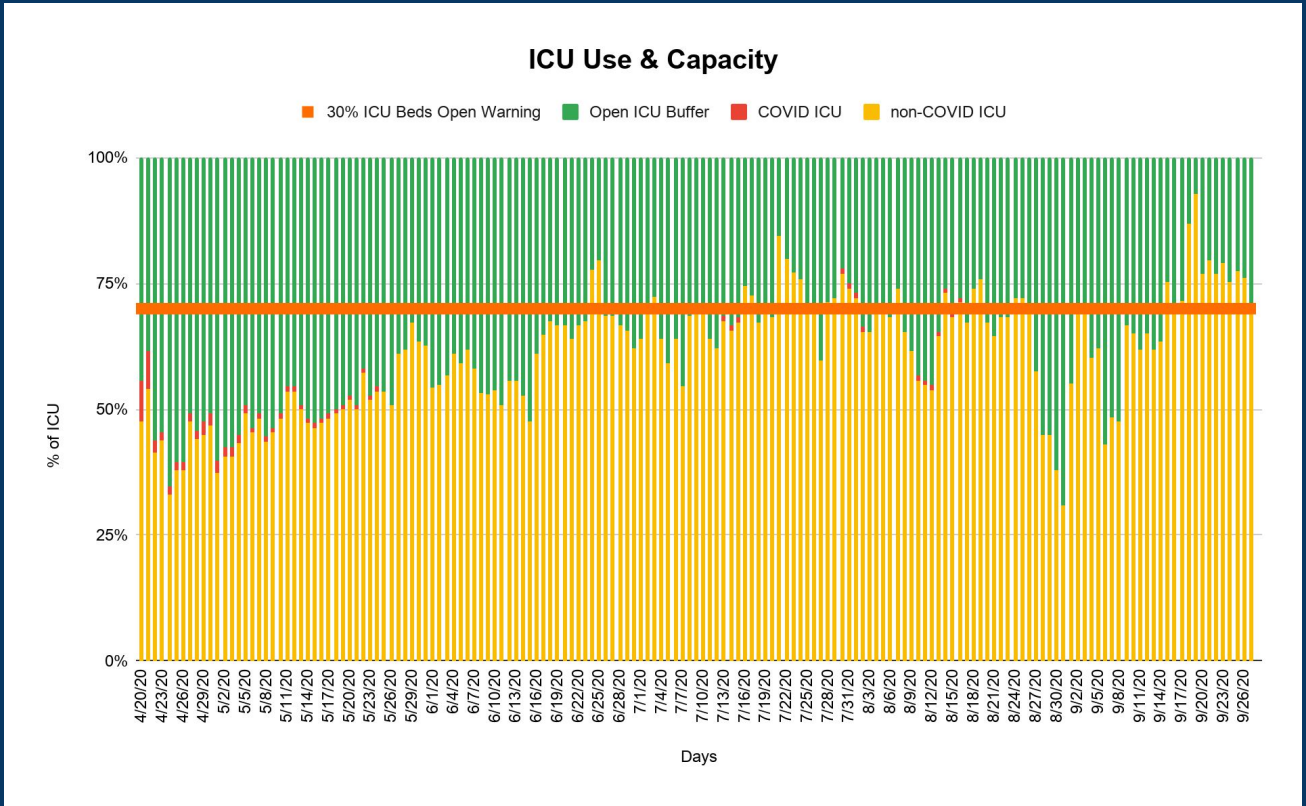
- **Summary:** Percent of tests resulting in a new positive case
- **Warning Flags:** New positives represent >5% of daily results



Source: Vermont Department of Health - September 29, 2020

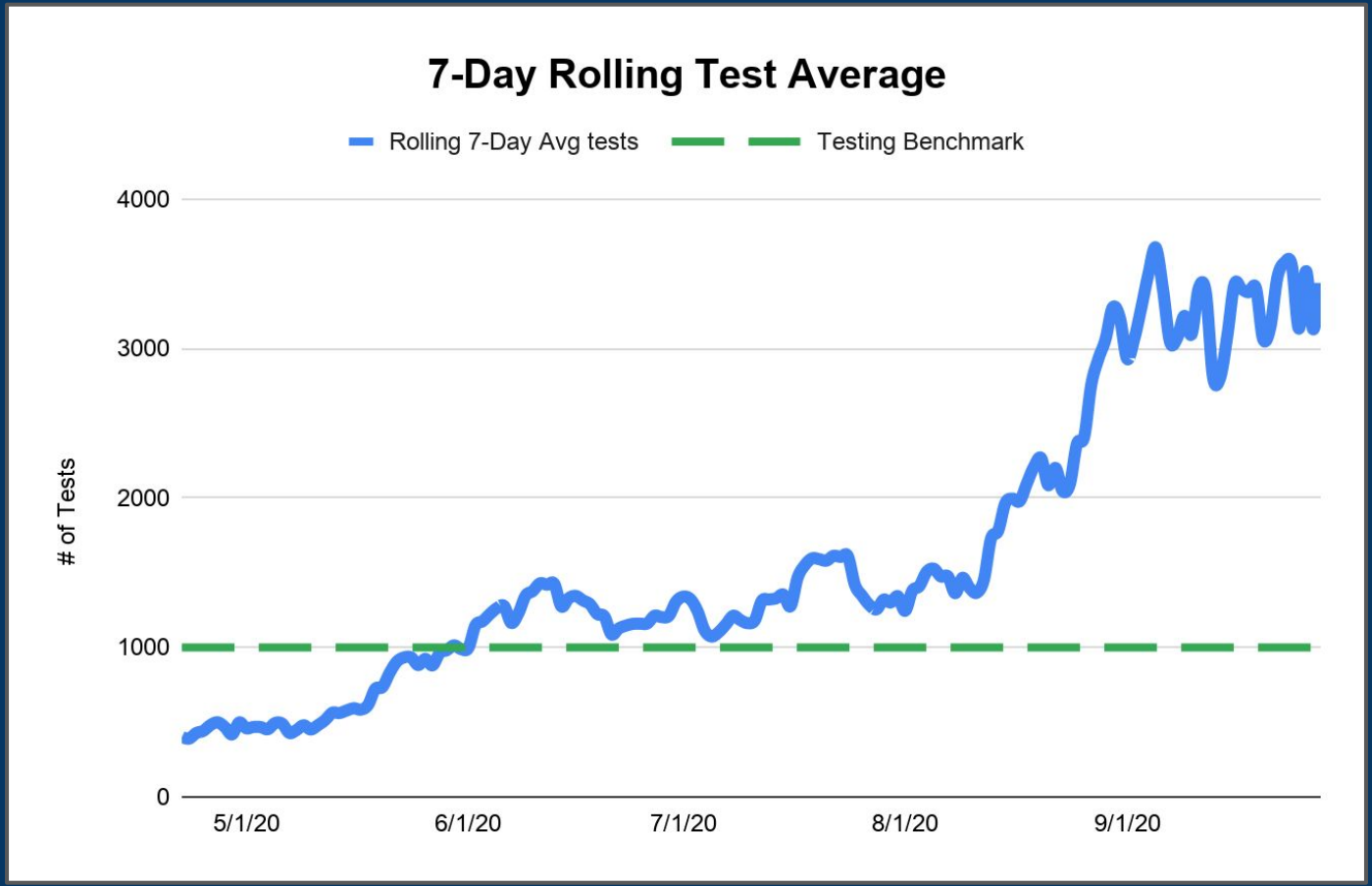
Data Point 4: Hospital & Critical Care Beds

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



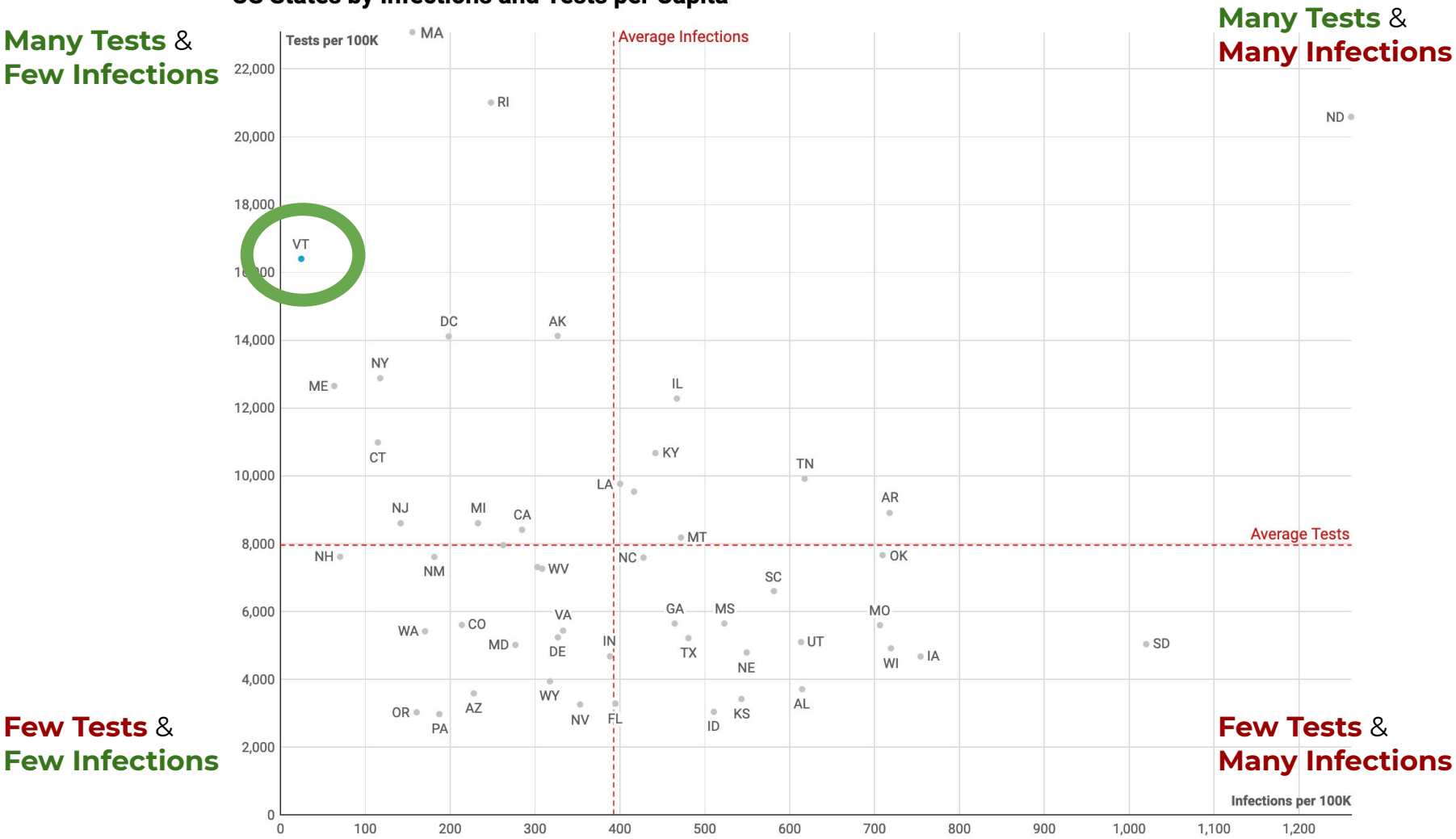
Source: Vermont Department of Health - September 29, 2020

Vermont Testing

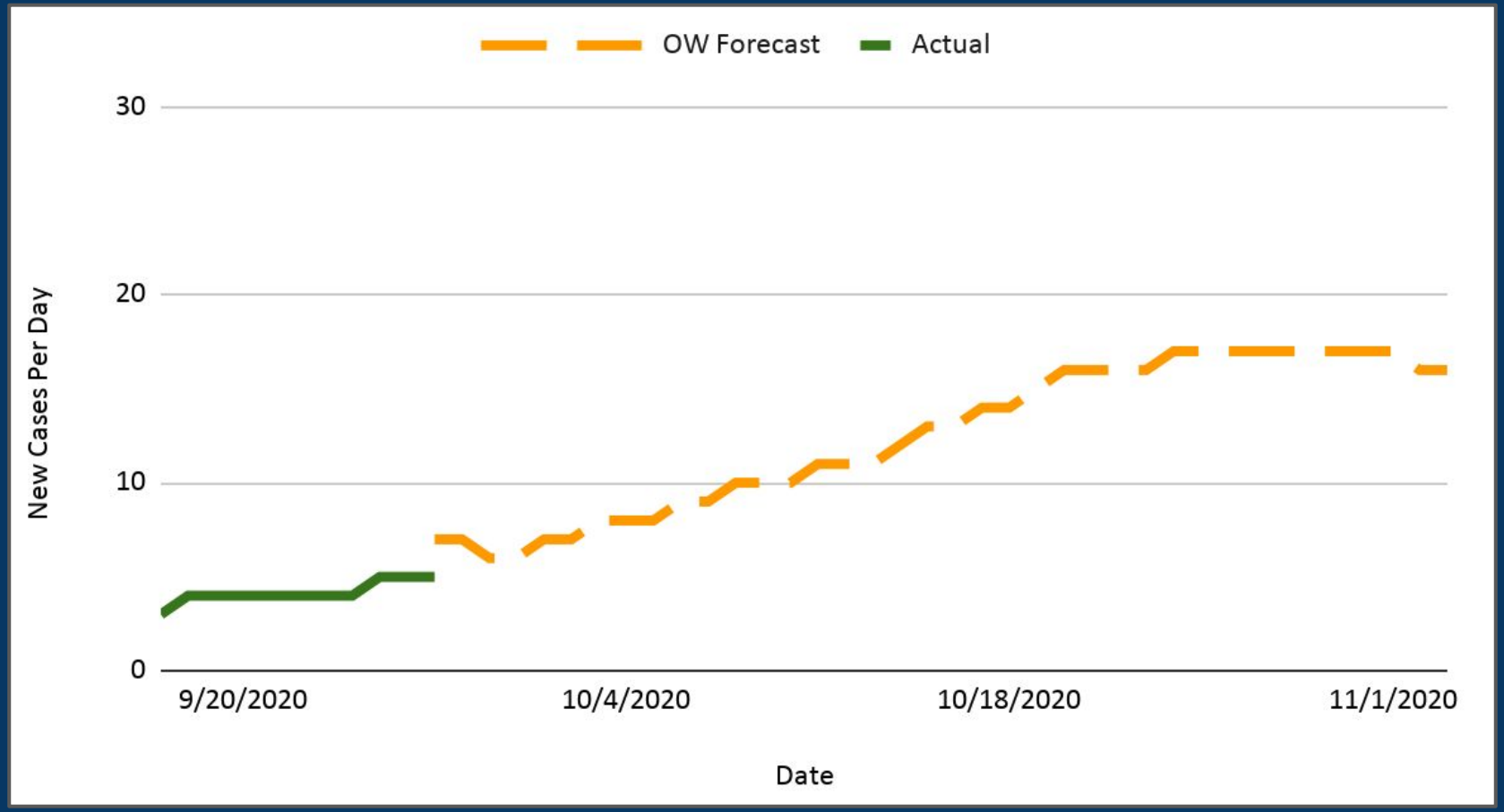


Source: Vermont Dept. of Health - September 29, 2020; results reported to VDH daily

US States by Infections and Tests per Capita



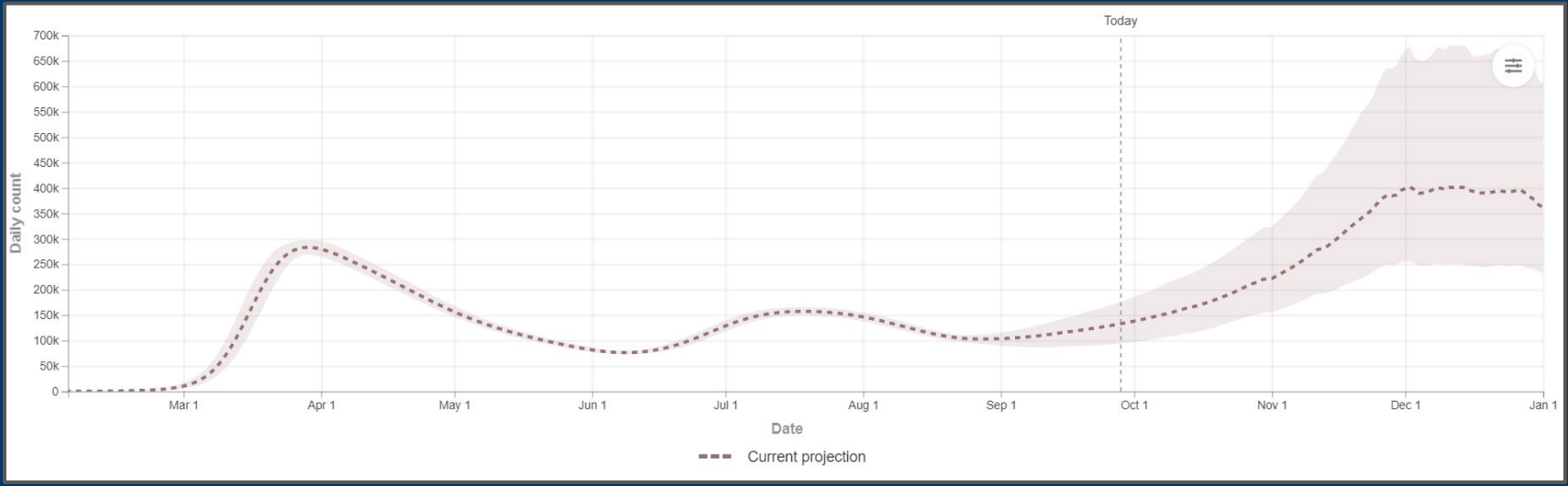
Vermont Forecast September 29 to November 3



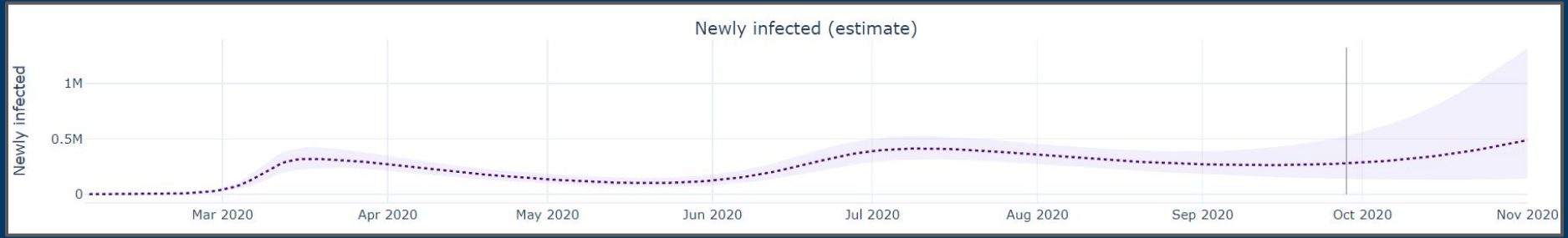
Source: Oliver Wyman Forecast Model - September 28, 2020

Avoiding Complacency In Vermont

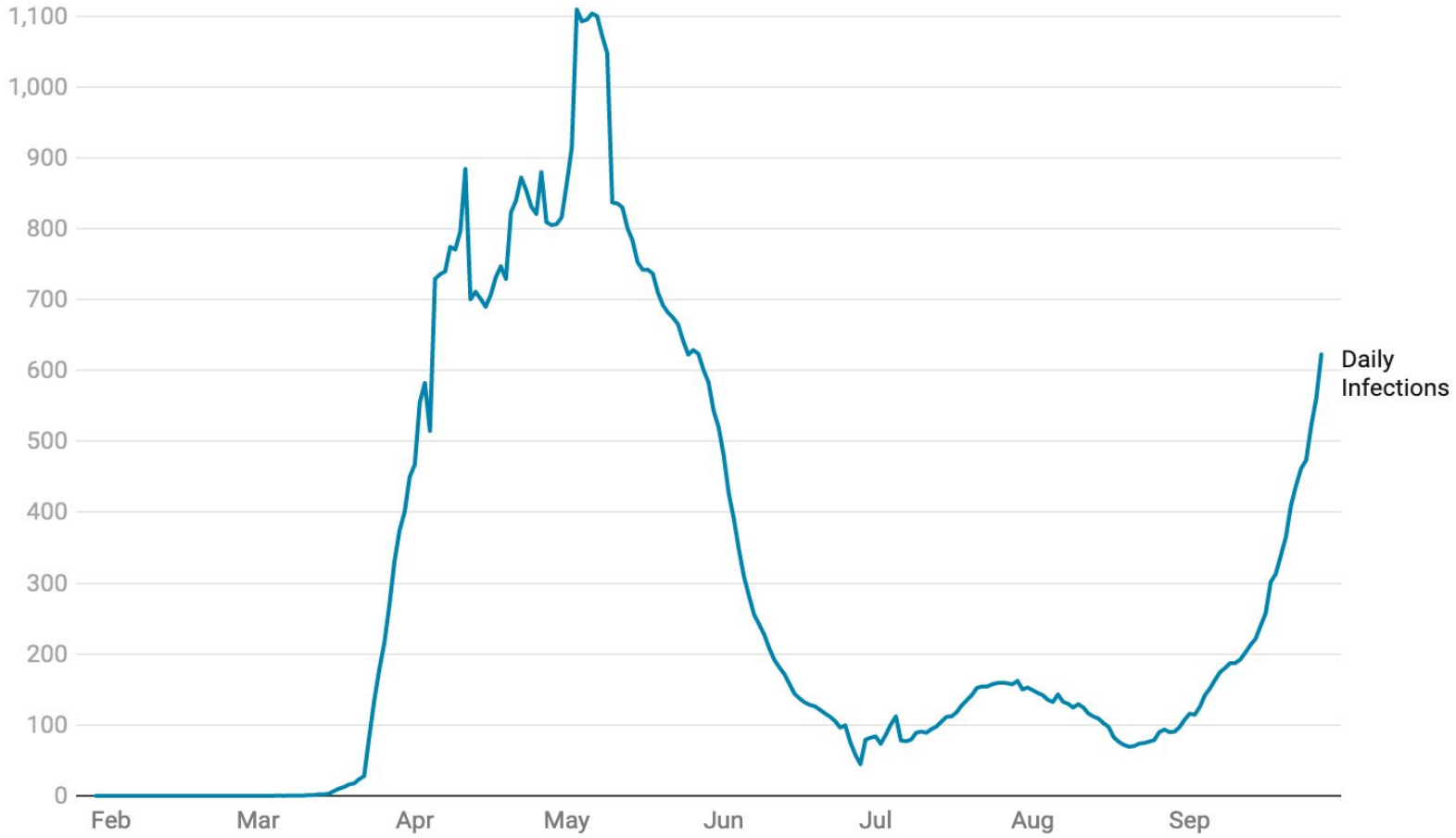
IHME Model - US Projection to January 1, 2021 (detected and undetected)



Youyang Gu Model - US Projection to November 1, 2020 (detected and undetected)



Quebec Daily Infections (7-Day Moving Average)



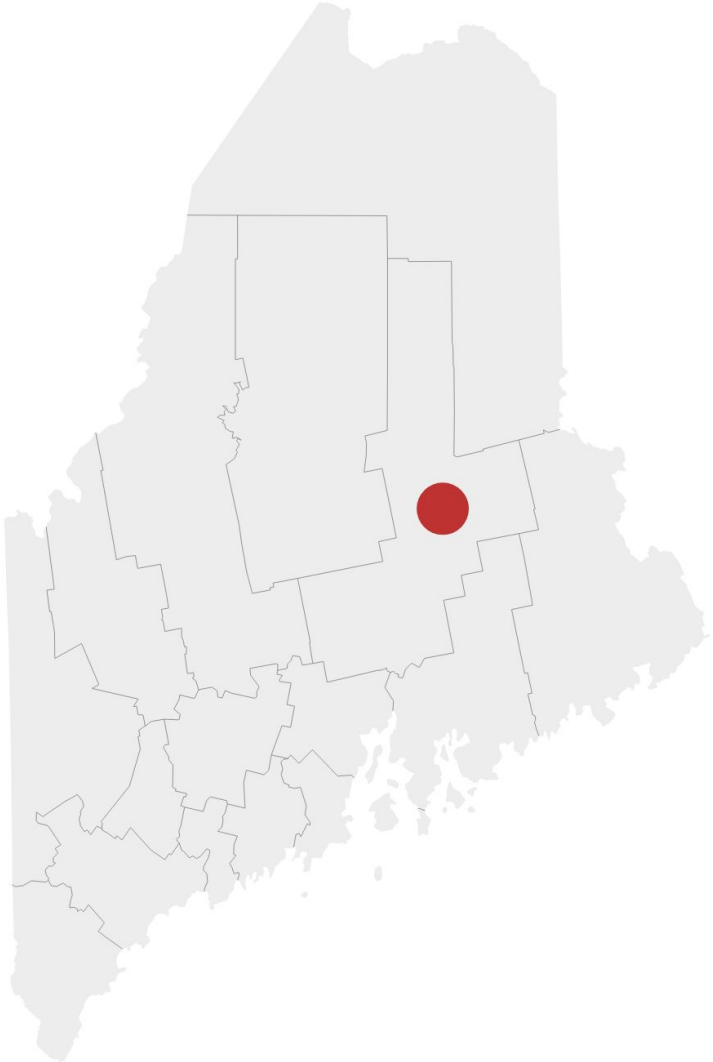
Source: Raw data from Johns Hopkins University—September 27, 2020

Outbreak Analysis

Wedding on August 7, 2020

Initial wedding event in Millinocket, Maine

- 62 attendees (state cap of 50)
- 18 attendees later test positive (no deaths)
- Indoors
- Few masks
- Little social distancing



Source: Maine CDC; Portland Press Herald

Outbreak Analysis

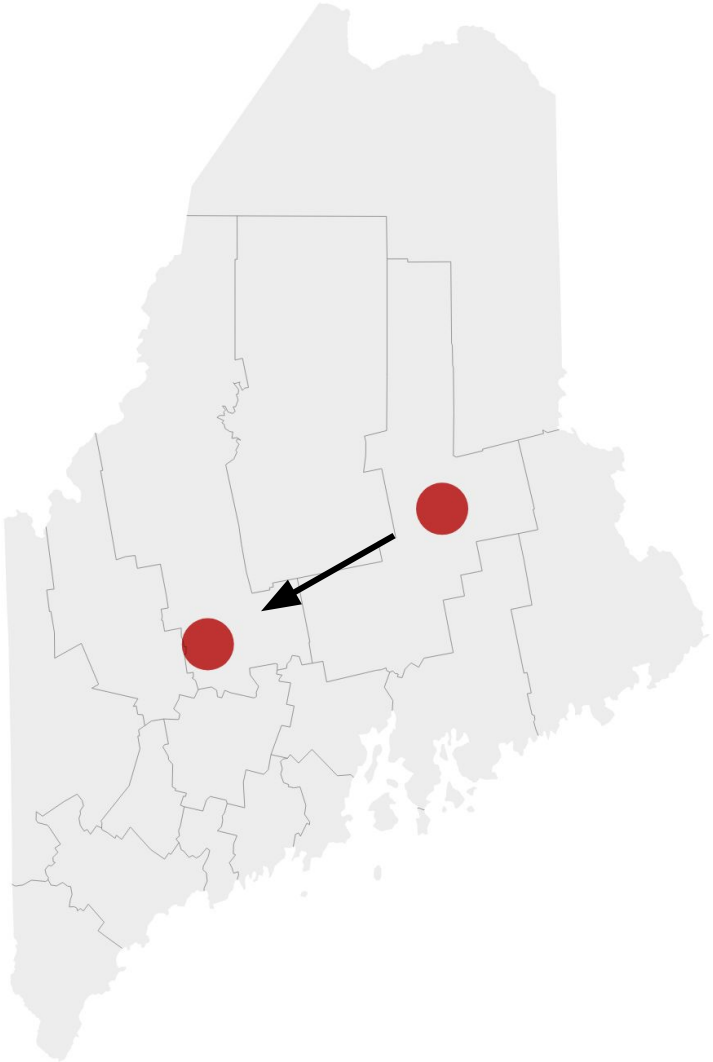
Maplecrest Rehabilitation Center

- Connected cases: **39**
- Deaths: **7**

On August 11, an infected sibling of wedding attendee works 10 hour shift at Maplecrest Rehab Center in Madison, Maine.

Employee works overnight shift despite reporting 4 symptoms and failing health screening.

Management does not check symptoms log.



Source: Maine CDC; Portland Press Herald

Outbreak Analysis

York County Jail

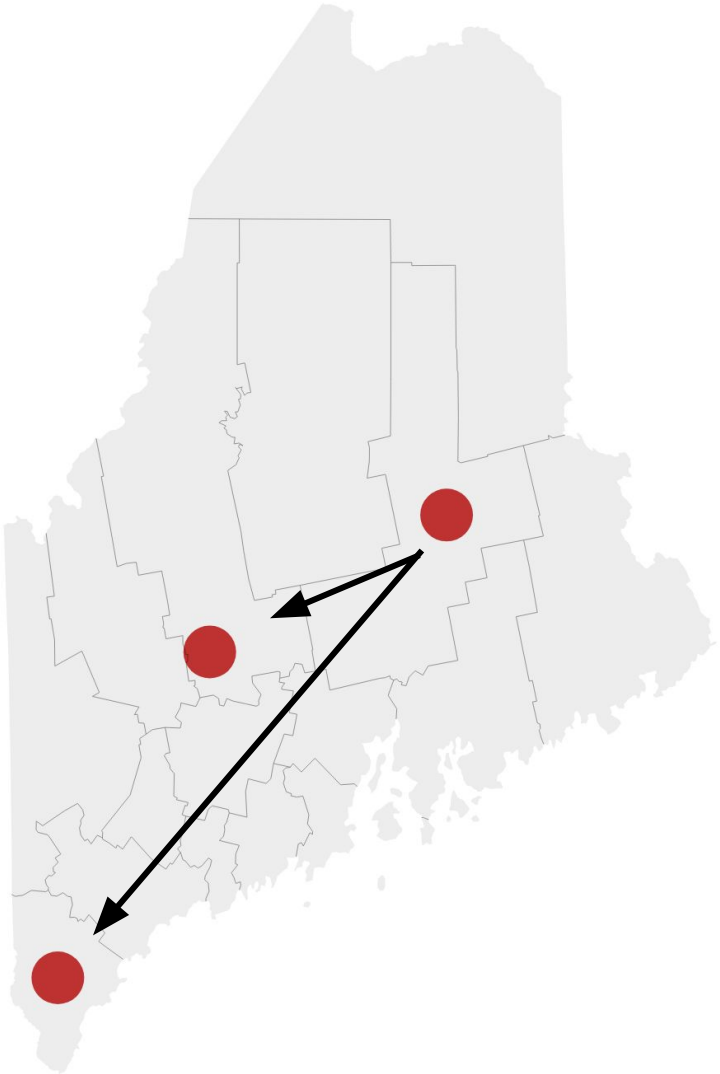
- Connected cases: **at least 85**
- Deaths: **0**

Infected wedding attendee works 200 miles south at York County Jail in Alfred, Maine.

Jail management did not require inmates or staff to wear face coverings.

No temperature checks or additional screening for staff entering jail.

Jail continued to accept new inmates, even after disease was detected in facility.



Source: Maine CDC; Portland Press Herald; Bangor Daily News

Outbreak Analysis

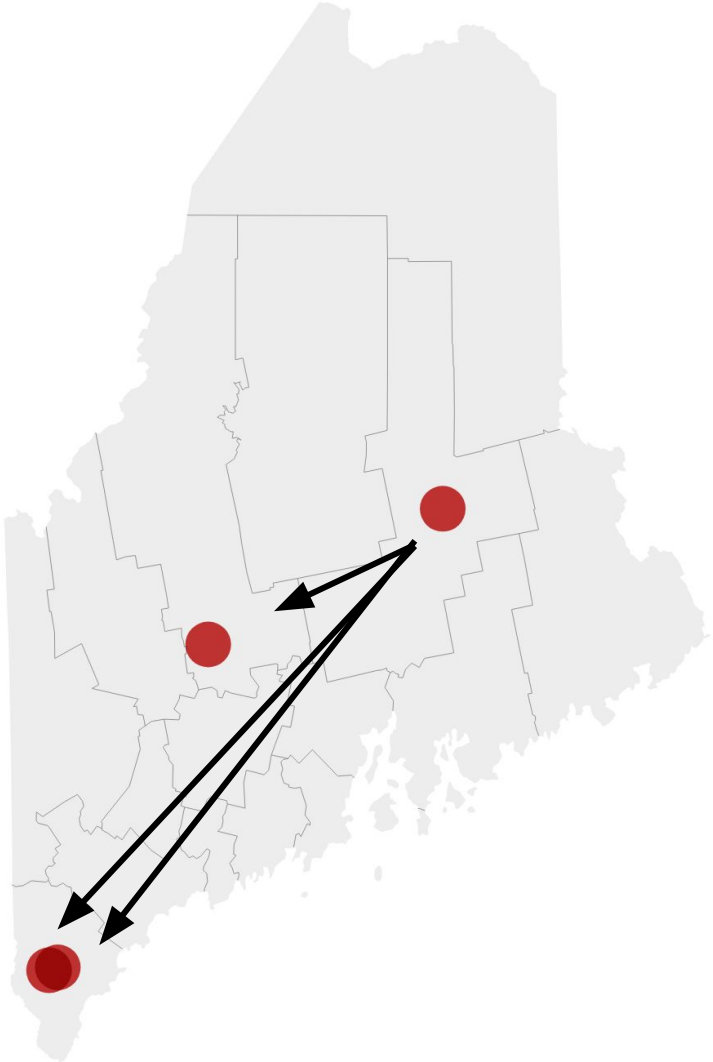
Calvary Baptist

- Cases: **at least 10**
- Deaths: **0**

Congregation of Calvary Baptist in Sanford includes pastor who officiated Millinocket wedding and six families who attended initial event.

Indoor service and choir singing without masks.

Pastor continues to encourage no mask wearing.



Source: Maine CDC; Portland Press Herald

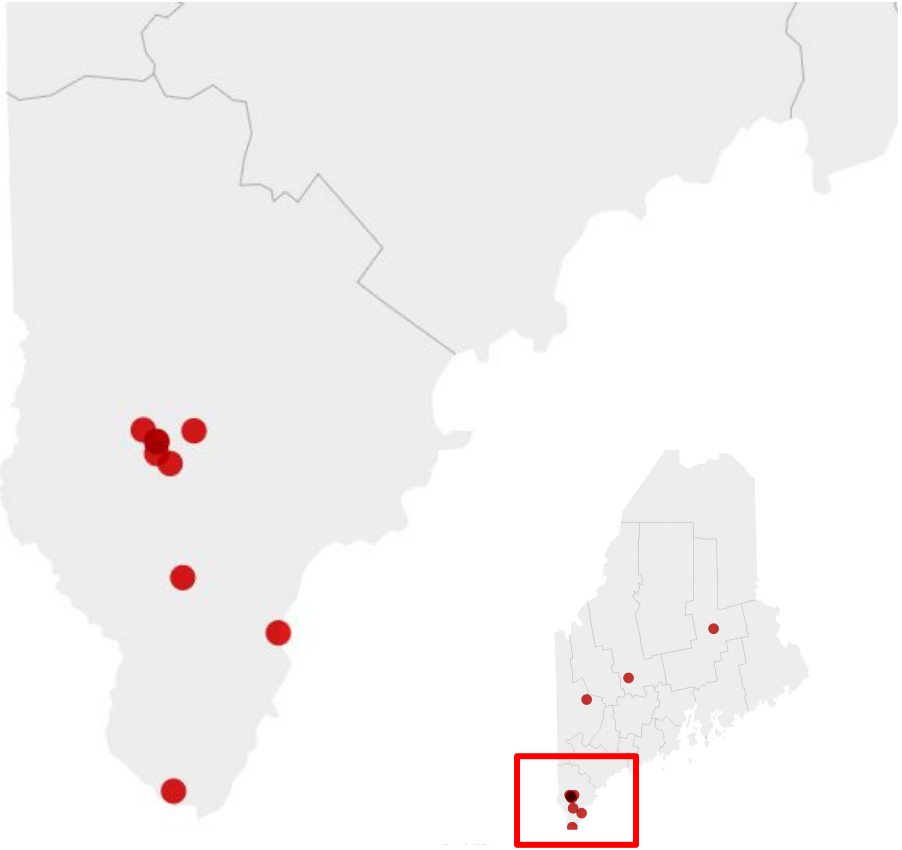
Outbreak Analysis

York County Outbreaks

- York County Jail: **85**
- Portsmouth Naval Shipyard: **18**
- Sanford High School: **13**
- Sanford American Legion funeral reception: **12**
- Calvary Baptist Church: **10**
- Brink Chiropractic Clinic: **3**
- Ogunquit Beach Lobster House: **3**

The "virus has achieved a certain level that it's everywhere in wide circulation across [York] county... I am extremely, extremely concerned."

- Dr. Nirav Shah, Maine CDC Director, 9/24/20

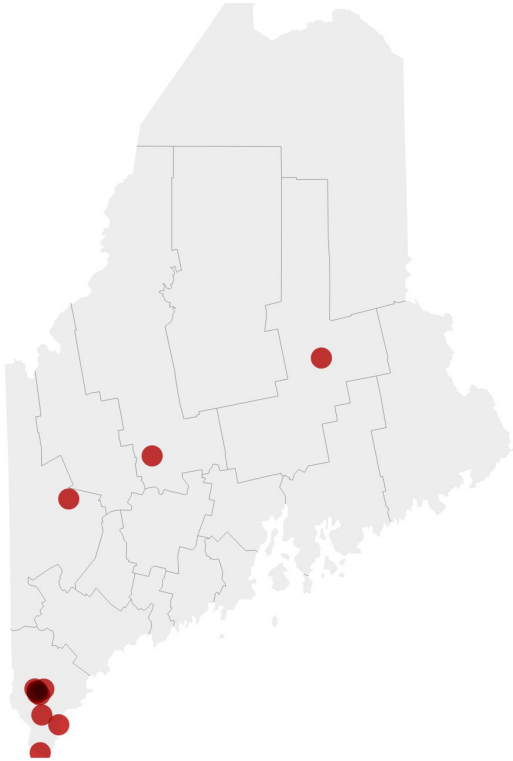


Source: Maine CDC; Portland Press Herald

Maine Outbreak Analysis

Outbreak Numbers

- Cases connected to Millinocket wedding: **At least 180**
- Connected deaths: **8**
- New cases in York are being identified at nearly **twice** the rate as the previous surges in early April and close to **triple** the current statewide average
- Sanford, pop. 22,000, makes up 44% of Maine's new cases



Risk Factors Identified by Maine CDC

- Lack of social distancing and mask wearing by individuals
- Institutional failures in following guidelines and regulations
- Complacency

Source: Maine CDC; Portland Press Herald

K-12 & Higher Education Update

WalletHub

Safest States to Reopen Schools

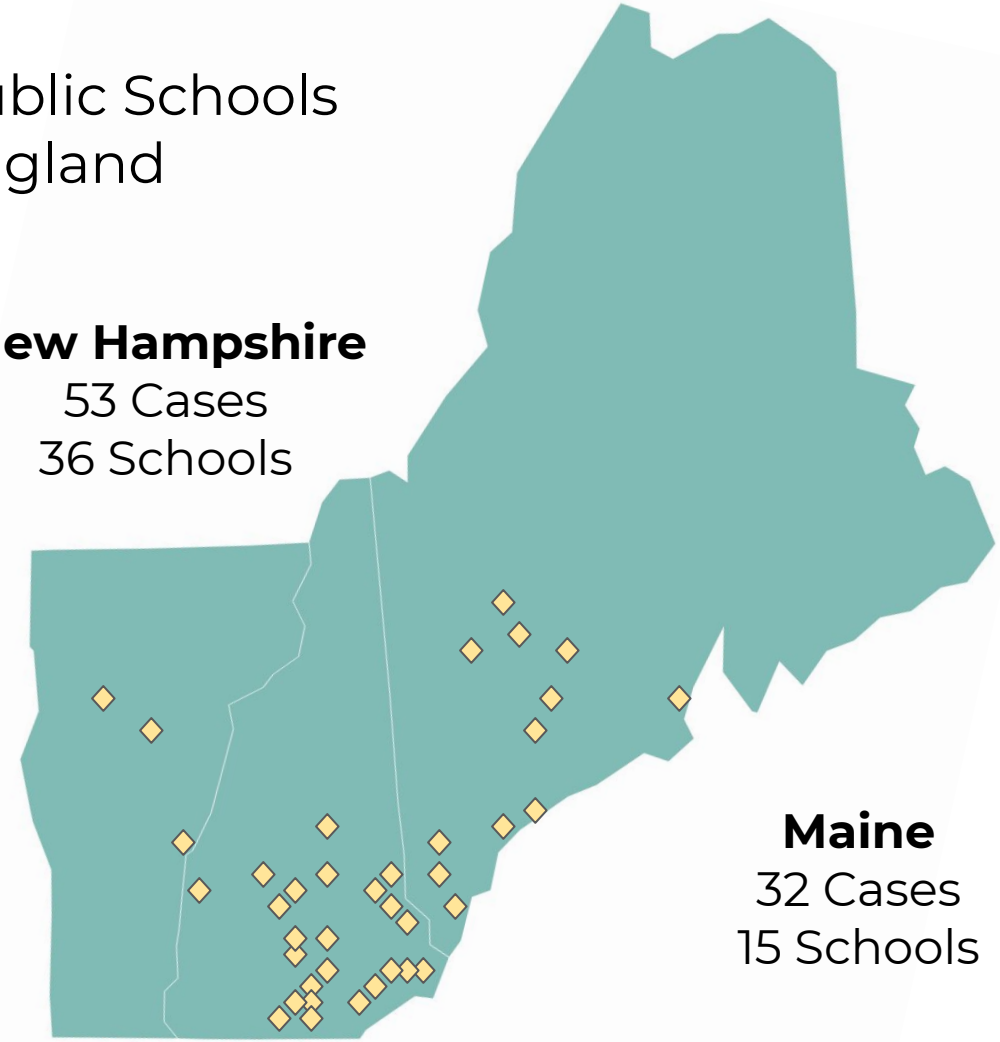
WalletHub analysis ranks Vermont as safest state to reopen schools

Overall Rank (1=Best)	State	Total Score	'Risk of COVID-19 Infections' Rank	'Health & Financial Infrastructure' Rank
1	Vermont	80.48	1	1
2	Maine	74.65	2	4
3	Pennsylvania	69.66	6	6
4	Massachusetts	69.27	5	21
5	New Hampshire	68.65	4	26
6	Rhode Island	66.85	14	3
7	Ohio	66.54	7	16
8	New Jersey	65.69	8	20
9	Connecticut	65.47	19	2
10	Nebraska	64.71	15	7

Source: WalletHub, 2020.Safest States for Schools to Reopen, September 28, 2020

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

New Hampshire
53 Cases
36 Schools



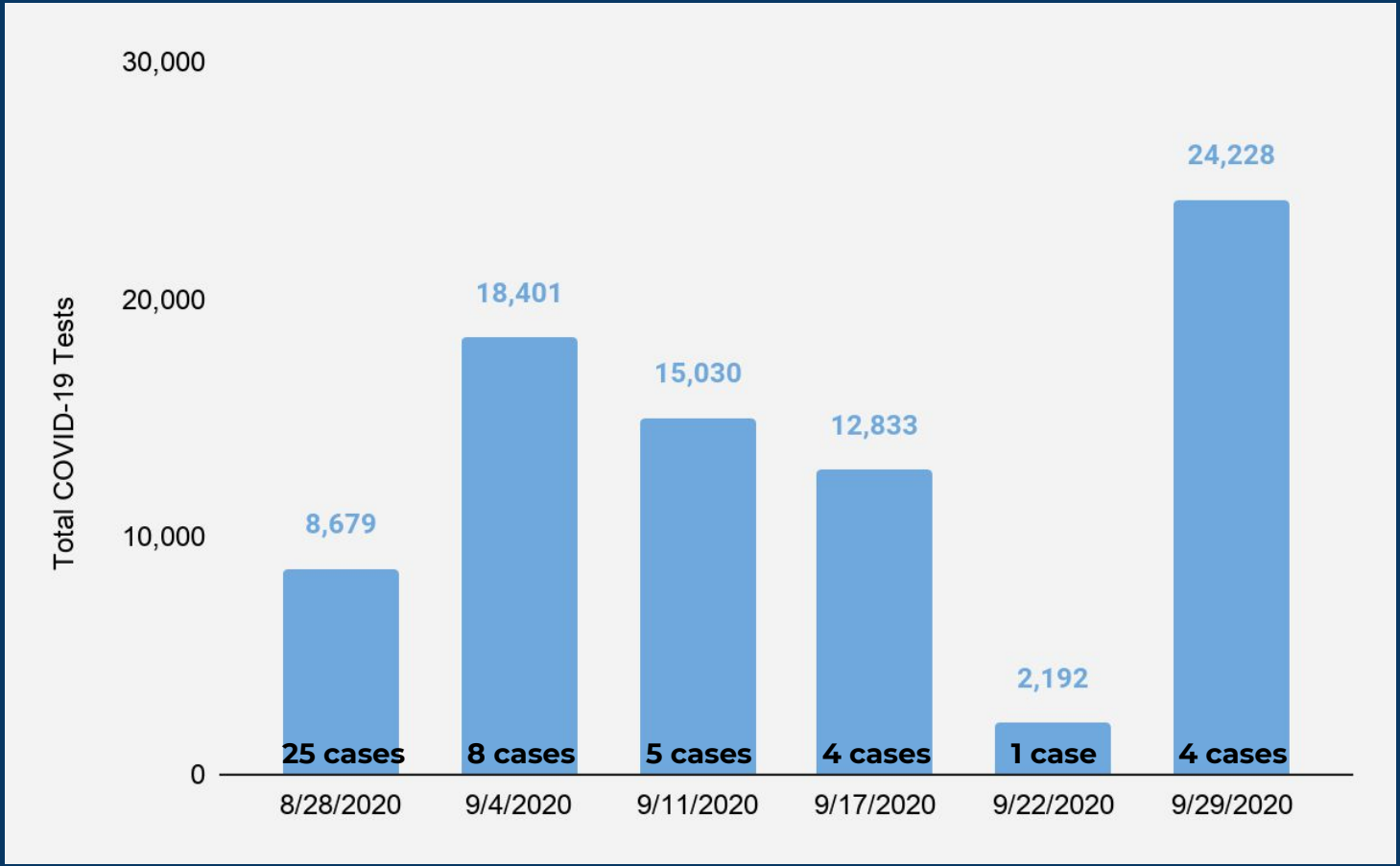
Vermont
4 Cases; 1 Presumed Positive

- 1 at Williamstown Middle & High School
  Williamstown, VT
- 1 at Hartford High School
  Hartford, VT
- 2 at Crossett Brook Middle School
  Duxbury, VT

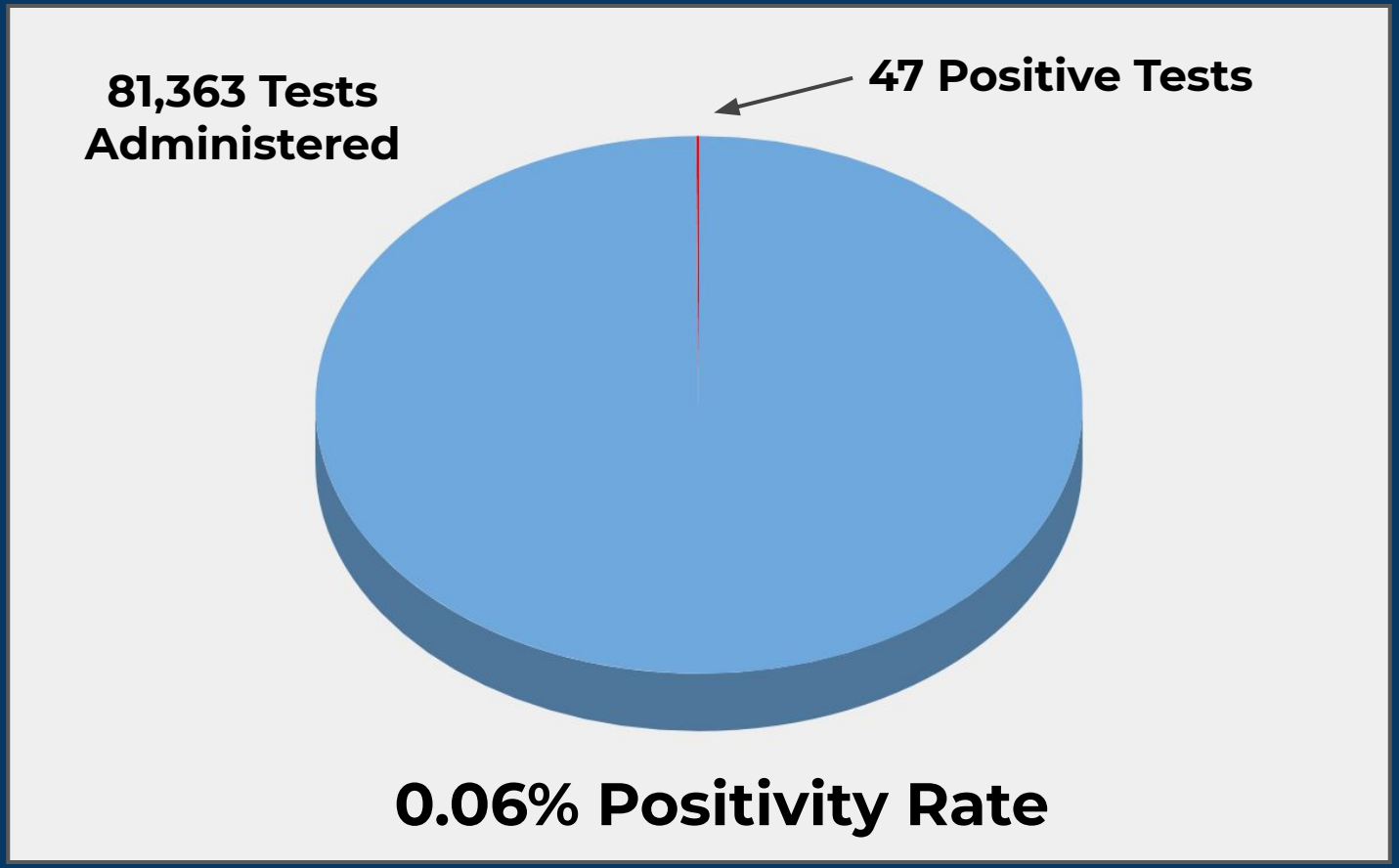
Maine
32 Cases
15 Schools

Source: VDH; New Hampshire School Dashboard; and public reporting

Weekly Test Results for Vermont Colleges & Universities
September 21 to September 28



Cumulative Test Results for Vermont Colleges & Universities as of September 28, 2020



Northern New England Higher Education Update

	Total	Positives	Positivity Rate
New Hampshire*	165,309	222	0.13%
Maine*	60,738	43	0.07%
Vermont	81,363	47	0.06%

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

Individual Test Results for Vermont Colleges & Universities as of September 28, 2020

College / University	Total Tests	Total Positives	Dashboard / Public Information
Middlebury College	6,735	2	https://www.middlebury.edu/office/midd2021/covid-reporting-dashboard
University of Vermont	50,065	28*	https://www.uvm.edu/returntocampus/uvm-weekly-testing-report
Norwich University	7,013	5	https://www.norwich.edu/news/psa
Northern Vermont University	2,896	0	https://www.northernvermont.edu/nvu-during-covid-19
Castleton University	1,203	2	https://www.castleton.edu/covid-19-coronavirus-updates/covid-19-test-results/
Vermont Technical College	408	3	https://www.vtc.edu/update-on-the-covid-19-coronavirus/
Saint Michael's College	2,529	1	https://www.smcvt.edu/return-to-campus/
Sterling College	86	0	Does not have a public dashboard at this time
Champlain College	6,898	2	https://view.champlain.edu/champlain-college-covid-19-testing-dashboard/
Bennington College	2,386	3	https://www.bennington.edu/covid-19-updates-and-information
Vermont College of Fine Arts	7	0	Does not have a public dashboard at this time
Vermont Law School	161	0	Remote learning for Fall 2020 - Some students using campus facilitites
Landmark College	877	1	https://www.landmark.edu/student-life/health-counseling-wellness/covid-19/covid-19-dashboard
Albany College of Pharmacy	99	0	https://www.acphs.edu/health-safety
Totals	81,363	47	

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

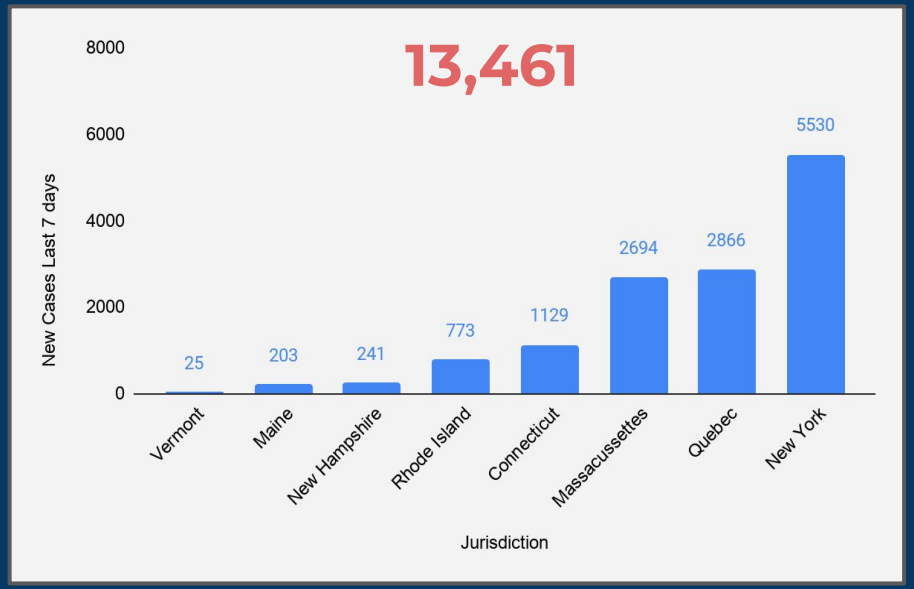
* Reconciling data that could possiblity remove up to 6 cases from the UVM count.

Regional Data

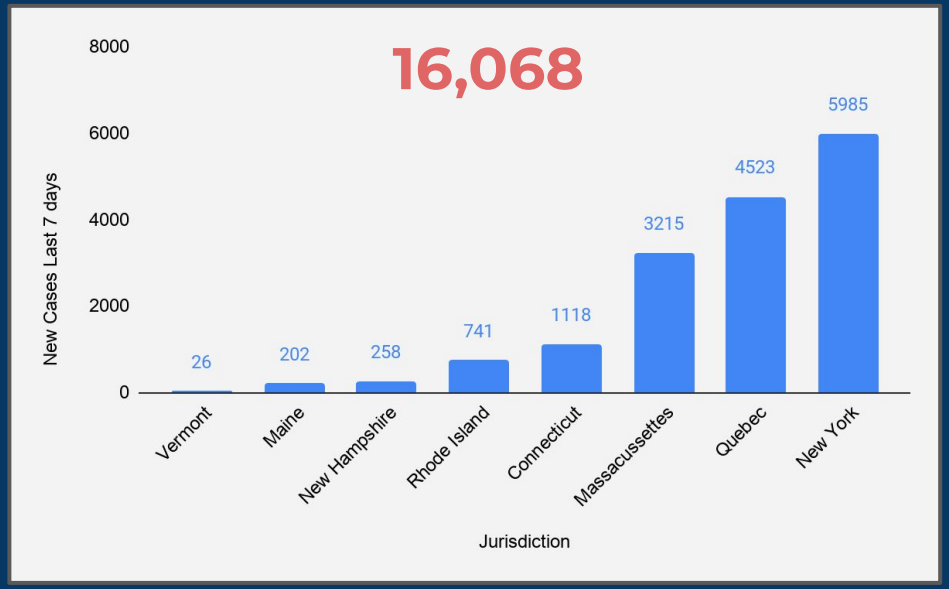
Regional Monitoring: New Cases Week Over Week

19.37% Increase in New Confirmed Cases

Positive Cases Sept. 14th to Sept. 20th

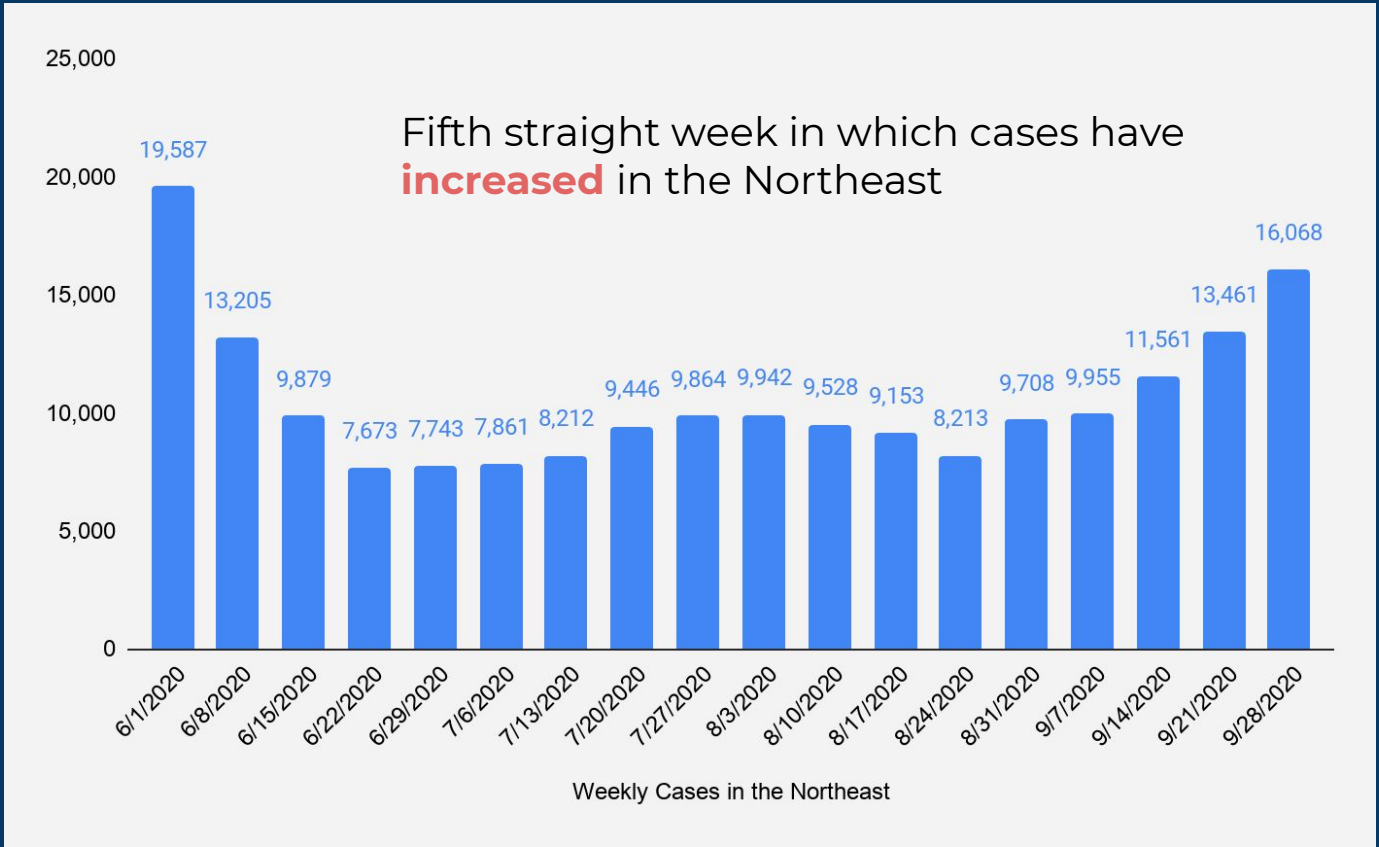


Positive Cases Sept. 21st to Sept. 28th



Sources: COVID-19 Tracking Project, New York Time Covid-19 Database & Government of Quebec

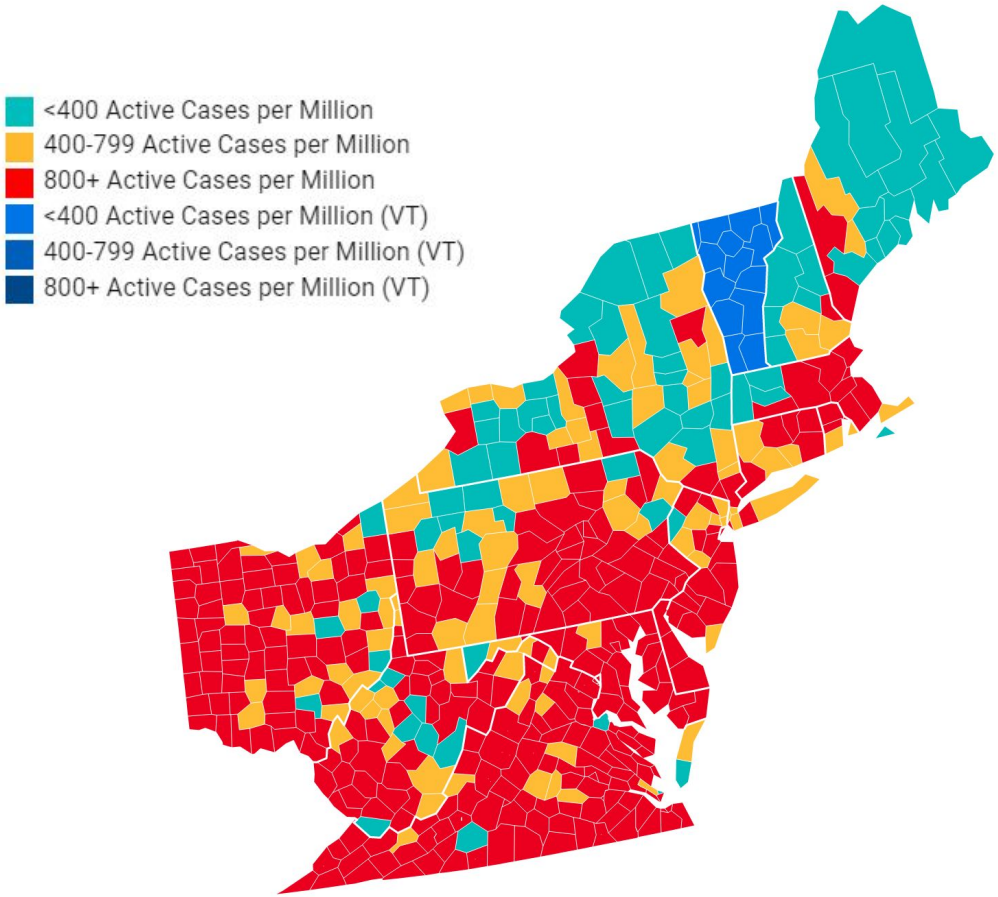
Regional Monitoring:
Week Over Week Case Growth Since May 21, 2020



Sources: COVID-19 Tracking Project, New York Times Covid-19 Database & Government of Quebec

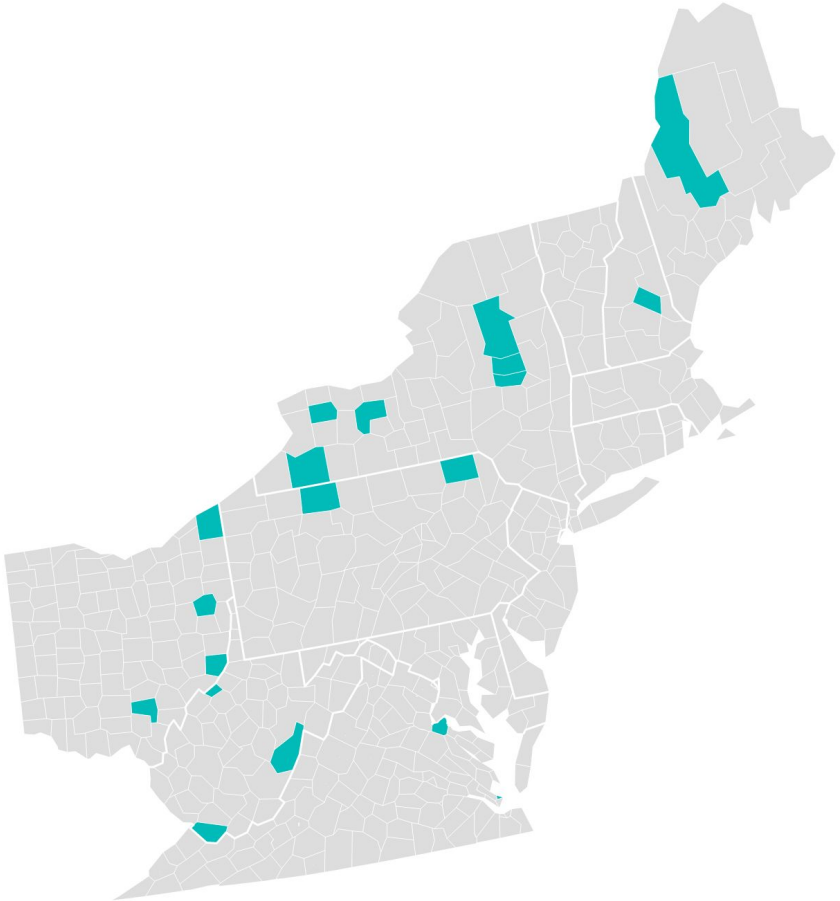
Travel Map Update

Updated Travel Map

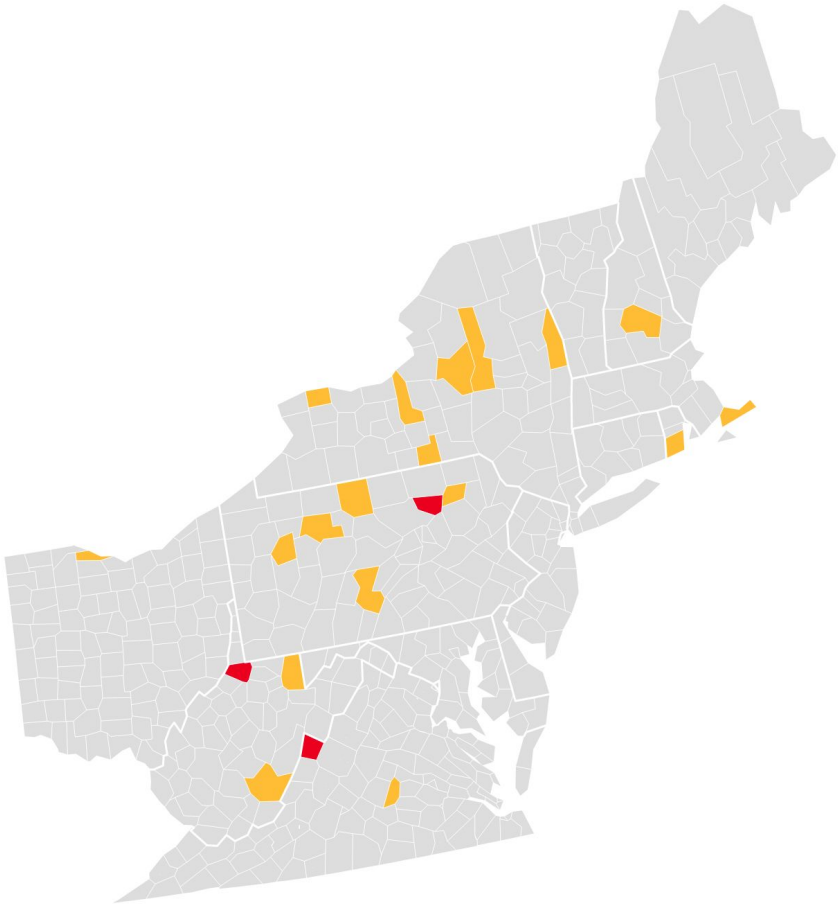
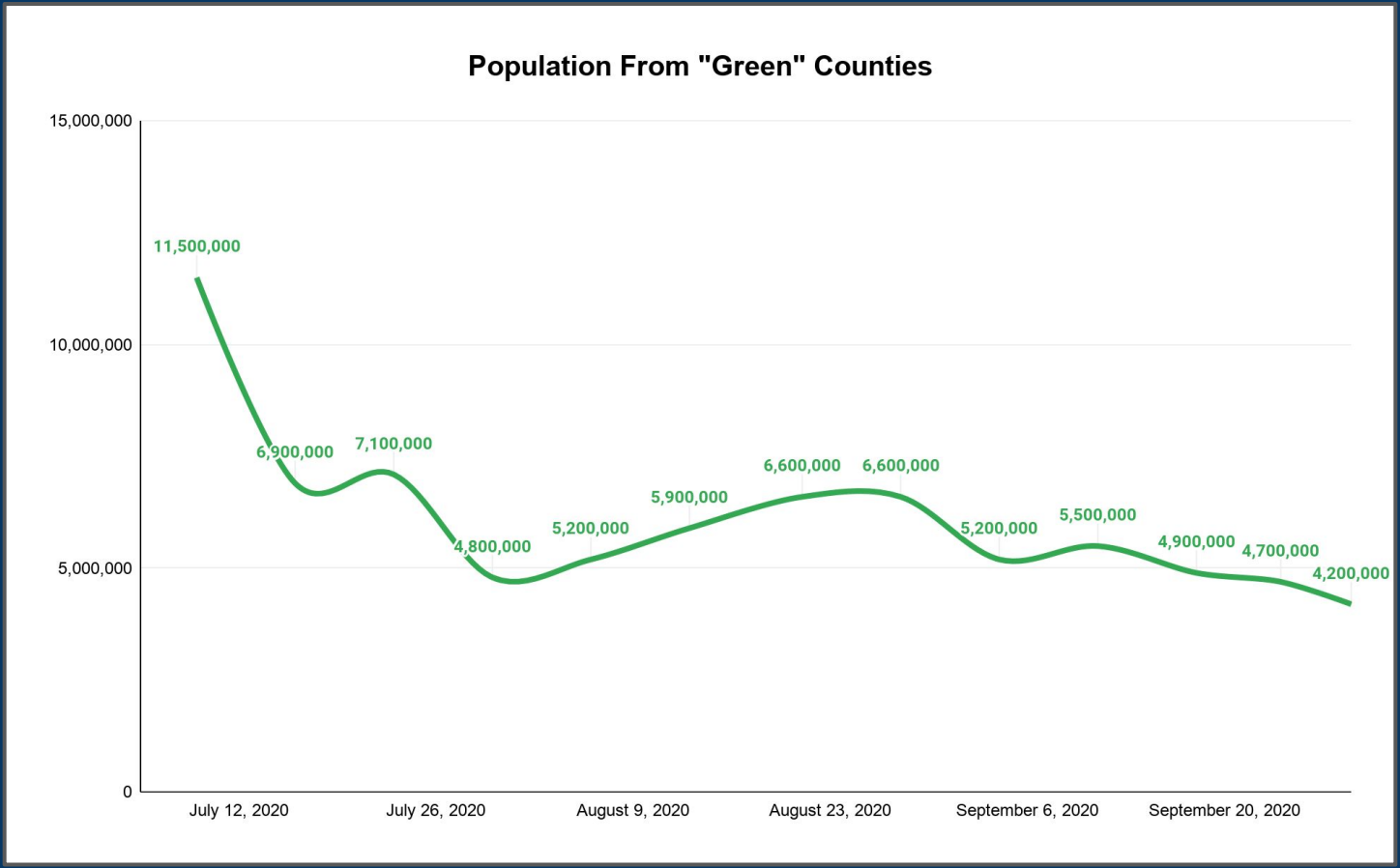


Source: Raw data from Johns Hopkins University—September 28, 2020 (dynamic map available at Vermont ACCD site)

Improving: Moving from Yellow or Red to Green



Worsening: Moving to Yellow or Red



Updated Travel Map