COVID-19 Modeling
November 10, 2020

Presentation available at: dfr.vermont.gov
## 10 Million+ U.S. Cases

**November 9, 2020**

<table>
<thead>
<tr>
<th>Cases</th>
<th>Days</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Million</td>
<td>99 Days</td>
</tr>
<tr>
<td>2 Million</td>
<td>43 Days</td>
</tr>
<tr>
<td>3 Million</td>
<td>28 Days</td>
</tr>
<tr>
<td>4 Million</td>
<td>15 Days</td>
</tr>
<tr>
<td>5 Million</td>
<td>17 Days</td>
</tr>
<tr>
<td>6 Million</td>
<td>23 Days</td>
</tr>
<tr>
<td>7 Million</td>
<td>27 Days</td>
</tr>
<tr>
<td>8 Million</td>
<td>20 Days</td>
</tr>
<tr>
<td>9 Million</td>
<td>13 Days</td>
</tr>
<tr>
<td>10 Million</td>
<td>10 Days</td>
</tr>
</tbody>
</table>

*Source: Johns Hopkins University*
Forecasted 79% increase in new cases over the next six weeks

Source: Johns Hopkins University Data & Oliver Wyman Forecast Model - November 9, 2020
U.S. Hospitalization Growth

Source: Raw data from COVID Tracking Project—November 9, 2020
U.S. Covid-19 Deaths

Source: Raw data from COVID Tracking Project—November 9, 2020
Regional Monitoring

33.86% Increase in New Confirmed Cases

Positive Cases Oct. 27th to Nov. 2nd

<table>
<thead>
<tr>
<th>Jurisdiction</th>
<th>New Cases Last 7 days</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vermont</td>
<td>134</td>
</tr>
<tr>
<td>Maine</td>
<td>555</td>
</tr>
<tr>
<td>New Hampshire</td>
<td>922</td>
</tr>
<tr>
<td>Rhode Island</td>
<td>3010</td>
</tr>
<tr>
<td>Connecticut</td>
<td>5759</td>
</tr>
<tr>
<td>Quebec</td>
<td>7096</td>
</tr>
<tr>
<td>Massachusetts</td>
<td>8049</td>
</tr>
<tr>
<td>New York</td>
<td>14713</td>
</tr>
</tbody>
</table>

Positive Cases Nov. 3rd to Nov. 9th

<table>
<thead>
<tr>
<th>Jurisdiction</th>
<th>New Cases Last 7 days</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vermont</td>
<td>196</td>
</tr>
<tr>
<td>Maine</td>
<td>1123</td>
</tr>
<tr>
<td>New Hampshire</td>
<td>1406</td>
</tr>
<tr>
<td>Rhode Island</td>
<td>3803</td>
</tr>
<tr>
<td>Connecticut</td>
<td>7075</td>
</tr>
<tr>
<td>Quebec</td>
<td>7903</td>
</tr>
<tr>
<td>Massachusetts</td>
<td>11544</td>
</tr>
<tr>
<td>New York</td>
<td>20812</td>
</tr>
</tbody>
</table>

Sources: State Health Departments, New York Time Covid-19 Database & Government of Quebec
Week-over-Week Northeast Case Growth Since March 16, 2020

Sources: State Health Departments, New York Times Covid-19 Database & Government of Quebec
New Hampshire
New Cases
(7-Day Avg.)

Maine
New Cases
(7-Day Avg.)

Massachusetts
New Cases
(7-Day Avg.)

New York
New Cases
(7-Day Avg.)
Forecasted 105% increase in new cases over the next six weeks

Source: Johns Hopkins University Data & Oliver Wyman Forecast Model - November 9, 2020 (New England & New York)
Vermont
New Cases 7-Day Average
Three Times with Accelerated Case Growth

Starting from a Higher Base of Cases
Multiple Simultaneous Outbreaks

Source: Vermont Department of Health - November 9, 2020
Vermonters With Confirmed Cases

Number of Confirmed Cases

Week (Tuesday to Monday)

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

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.
Vermont COVID-19 New Cases Forecast

7-Day Average

Source: Oliver Wyman Forecast Model - November 9, 2020
Canadian Thanksgiving
A Cautionary Tale
Canadian Thanksgiving

- Celebrated Second Monday in October (October 12, 2020)
- Families gather for a Thanksgiving meal
- Turkey is the mainstay and traditional Canadian Football doubleheader played
- Celebrated to different degrees across Canada
Case Growth After Canadian Thanksgiving

Saskatchewan

Oct. 12th

Manitoba

Oct. 12th

British Columbia

Oct. 12th

Alberta

Oct. 12th
Case Growth After Canadian Thanksgiving

Newfoundland and Labrador

Oct. 12th

Nova Scotia

Oct. 12th

New Brunswick

Oct. 12th

Prince Edward Island

Oct. 12th
Daily COVID-19 Infections per 100K in Canadian Provinces Celebrating Thanksgiving

Measured as a 7-day moving average

- Manitoba
- Alberta
- British Columbia
- Saskatchewan
- Ontario

Canadian Thanksgiving

Daily COVID-19 Infections per 100K in Canadian Provinces Not Celebrating Thanksgiving

Measured as a 7-day moving average

- Nova Scotia
- New Brunswick
- Newfoundland and Labrador
- Prince Edward Island

Canadian Thanksgiving
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

**Percent of Emergent Care Visits for COVID-19 like illness and Influenza Diagnosis**

Syndromic Surveillance from 13 of 14 Vermont Hospitals and 2 Urgent Care Centers

Source: Vermont Department of Health—November 6, 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 10, 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 10, 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 10, 2020
Vermont Testing

7-Day Rolling Test Average

# of Tests

5/1/20 7/1/20 9/1/20 11/1/20

Source: Vermont Dept. of Health—November 10, 2020; results reported to VDH daily

*Data from UVMHN may be incomplete or delayed
Vermont Flu Vaccine Data
+4.4% Flu Vaccination Increase Compared to Same Time in 2019

Year to Date

2019 Actual

270,275

164,183

Year to Date

2020 Goal

325,000

171,390*

Year to Date

52.7%* to 2020 goal

*Data from UVMHN may be incomplete or delayed

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

Through November 1, 2019 & 2020

Note: Data from UVMHN may be incomplete or delayed
K-12 & Higher Education Update
Covid-19 Cases in K-12 Public Schools Across Northern New England

**Vermont**
- 54 Cases
- 41 Schools

**New Hampshire**
- 406 Cases
- 186 Schools

**Maine**
- 211 Cases
- 93 Schools

Source: VT, NH and ME K-12 Dashboards
Vermont Higher Education Restart
Weekly Covid-19 Testing Among Students

178,701 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

140 Total Cases

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

Source: Vermont Colleges and Universities (presentation switched to Tuesday on September 22, 2020)
## Northern New England Higher Education Update

<table>
<thead>
<tr>
<th>State</th>
<th>Total Tests</th>
<th>Positives</th>
<th>Positivity Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>New Hampshire*</td>
<td>370,762</td>
<td>463</td>
<td>0.12%</td>
</tr>
<tr>
<td>Maine*</td>
<td>122,960</td>
<td>107</td>
<td>0.09%</td>
</tr>
<tr>
<td>Vermont</td>
<td>178,701</td>
<td>140</td>
<td>0.08%</td>
</tr>
</tbody>
</table>

* Includes NH & ME colleges & universities that publicly provide COVID-19 testing data.
## Vermont Higher Education Restart
### Institution Data as of November 10, 2020

<table>
<thead>
<tr>
<th>College / University</th>
<th>Total Tests</th>
<th>Student Positives</th>
<th>Faculty Positives</th>
<th>Dashboard / Public Information</th>
</tr>
</thead>
<tbody>
<tr>
<td>Middlebury College</td>
<td>11,197</td>
<td>2</td>
<td>2</td>
<td><a href="https://www.middlebury.edu/office/midd2021/covid-reporting-dashboard">https://www.middlebury.edu/office/midd2021/covid-reporting-dashboard</a></td>
</tr>
<tr>
<td>University of Vermont</td>
<td>116,417</td>
<td>34</td>
<td>2</td>
<td><a href="https://www.uvm.edu/returntocampus/uvm-weekly-testing-report">https://www.uvm.edu/returntocampus/uvm-weekly-testing-report</a></td>
</tr>
<tr>
<td>Norwich University</td>
<td>13,720</td>
<td>8</td>
<td>1</td>
<td><a href="https://www.norwich.edu/news/psa">https://www.norwich.edu/news/psa</a></td>
</tr>
<tr>
<td>Northern Vermont University</td>
<td>4,373</td>
<td>2</td>
<td>0</td>
<td><a href="https://www.northernvermont.edu/nvu-during-covid-19">https://www.northernvermont.edu/nvu-during-covid-19</a></td>
</tr>
<tr>
<td>Castleton University</td>
<td>1,394</td>
<td>2</td>
<td>0</td>
<td><a href="https://www.castleton.edu/covid-19-coronavirus-updates/covid-19-test-results/">https://www.castleton.edu/covid-19-coronavirus-updates/covid-19-test-results/</a></td>
</tr>
<tr>
<td>Saint Michael's College</td>
<td>8,092</td>
<td>77</td>
<td>0</td>
<td><a href="https://www.smcvt.edu/return-to-campus/">https://www.smcvt.edu/return-to-campus/</a></td>
</tr>
<tr>
<td>Sterling College</td>
<td>212</td>
<td>0</td>
<td>0</td>
<td><a href="https://sterlingcollege.edu/coronavirus-2019/">https://sterlingcollege.edu/coronavirus-2019/</a></td>
</tr>
<tr>
<td>Bennington College</td>
<td>5,583</td>
<td>3</td>
<td>0</td>
<td><a href="https://www.bennington.edu/covid-19-updates-and-information">https://www.bennington.edu/covid-19-updates-and-information</a></td>
</tr>
<tr>
<td>Vermont College of Fine Arts</td>
<td>7</td>
<td>0</td>
<td>0</td>
<td>Does not have a public dashboard at this time</td>
</tr>
<tr>
<td>Vermont Law School</td>
<td>165</td>
<td>0</td>
<td>0</td>
<td>Remote learning for Fall 2020 - Some students using campus facilities</td>
</tr>
<tr>
<td>Landmark College</td>
<td>1,841</td>
<td>2</td>
<td>1</td>
<td><a href="https://www.landmark.edu/student-life/health-counseling-wellness/covid-19/covid-19-dashboard">https://www.landmark.edu/student-life/health-counseling-wellness/covid-19/covid-19-dashboard</a></td>
</tr>
<tr>
<td>Albany College of Pharmacy</td>
<td>139</td>
<td>1</td>
<td>0</td>
<td><a href="https://www.acphs.edu/health-safety">https://www.acphs.edu/health-safety</a></td>
</tr>
<tr>
<td><strong>Totals</strong></td>
<td><strong>178,701</strong></td>
<td><strong>140</strong></td>
<td><strong>6</strong></td>
<td></td>
</tr>
</tbody>
</table>

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