COVID-19 Modeling
November 17, 2020

Presentation available at:
dfr.vermont.gov
<table>
<thead>
<tr>
<th>Cases</th>
<th>Days</th>
<th>Cases</th>
<th>Days</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Million</td>
<td>99</td>
<td>6 Million</td>
<td>23</td>
</tr>
<tr>
<td>2 Million</td>
<td>43</td>
<td>7 Million</td>
<td>27</td>
</tr>
<tr>
<td>3 Million</td>
<td>28</td>
<td>8 Million</td>
<td>20</td>
</tr>
<tr>
<td>4 Million</td>
<td>15</td>
<td>9 Million</td>
<td>13</td>
</tr>
<tr>
<td>5 Million</td>
<td>17</td>
<td>10 Million</td>
<td>10</td>
</tr>
<tr>
<td>11 Million+</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Source: Johns Hopkins University
Over 3,000 Reported Cases in Vermont

Sources: Vermont Department of Health
U.S. Case Growth

COVID-19 Hospitalizations

- 32,000 Daily Infections
- 66,500 Daily Infections
- 148,500 Daily Infections

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
Forecasted 71% increase in new cases over the next six weeks

National Forecast

Source: Johns Hopkins University Data & Oliver Wyman Forecast Model - November 17, 2020
U.S. Hospitalization Growth

COVID-19 Hospitalizations

60,000 Hospitalized

60,000 Hospitalized

73,000 Hospitalized

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

~46.43% Increase in New Confirmed Cases

Positive Cases Nov. 3rd to Nov. 9th

53,934

Positive Cases Nov. 10th to Nov. 16th

78,978

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
Forecasted 153% increase in new cases over the next six weeks

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

Travel Map as of November 17

Regional Heat Map as of November 17
Vermonters With Confirmed Cases by Week

Sources: Vermont Department of Health (week calculated as Tuesday to Monday)
“Halloween Surge” Exposure, Symptoms, Testing & Reporting

Source: Vermont Department of Health
New Mitigation Measures

Day 1
Day 10
Day 14

New Daily Cases
7 Day Rolling Average
Vermont Hospitalizations
Recent Uptick
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

Forecasted 50% increase in new cases over the next six weeks

Source: Oliver Wyman Forecast Model - November 17, 2020
Vermont Hospital & ICU Forecast

Forecasts Assume 3% Hospitalization & ICU Rate

Source: Oliver Wyman Forecast Model - November 16, 2020
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

7-Day Rolling Test Average

- Rolling 7-Day Test Average
- Testing Benchmark

*Data from UVMHN may be incomplete or delayed

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

Vermont
74 Cases
53 Schools

New Hampshire
505 Cases
214 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)
174 Total Cases
## 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>404,886</td>
<td>584</td>
<td>0.14%</td>
</tr>
<tr>
<td>Maine*</td>
<td>132,724</td>
<td>158</td>
<td>0.12%</td>
</tr>
<tr>
<td>Vermont</td>
<td>195,690</td>
<td>174</td>
<td>0.09%</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 17, 2020

<table>
<thead>
<tr>
<th>College / University</th>
<th>Total Tests</th>
<th>Student Positives</th>
<th>Employee Positives</th>
<th>Dashboard / Public Information</th>
</tr>
</thead>
<tbody>
<tr>
<td>Middlebury College</td>
<td>11,957</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>127,122</td>
<td>61</td>
<td>10</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>15,169</td>
<td>10</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>4,732</td>
<td>5</td>
<td>1</td>
<td><a href="https://www.northernvermont.edu/avu-during-covid-19">https://www.northernvermont.edu/avu-during-covid-19</a></td>
</tr>
<tr>
<td>Castleton University</td>
<td>1,398</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>8,750</td>
<td>79</td>
<td>0</td>
<td><a href="https://www.smccvt.edu/return-to-campus/">https://www.smccvt.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://starlingcollege.edu/coronavirus-2019/">https://starlingcollege.edu/coronavirus-2019/</a></td>
</tr>
<tr>
<td>Champlain College</td>
<td>16,789</td>
<td>5</td>
<td>0</td>
<td><a href="https://view.champlain.edu/champlain-college-covid-19-testing-dashboard/">https://view.champlain.edu/champlain-college-covid-19-testing-dashboard/</a></td>
</tr>
<tr>
<td>Bennington College</td>
<td>6,403</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>165</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>7</td>
<td>0</td>
<td>0</td>
<td>Remote learning for Fall 2020 - Some students using campus facilities</td>
</tr>
<tr>
<td>Albany College of Pharmacy</td>
<td>144</td>
<td>1</td>
<td>0</td>
<td><a href="https://www.aepsu.edu/health-safety">https://www.aepsu.edu/health-safety</a></td>
</tr>
<tr>
<td><strong>Totals</strong></td>
<td><strong>195,690</strong></td>
<td><strong>174</strong></td>
<td><strong>17</strong></td>
<td></td>
</tr>
</tbody>
</table>

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