COVID-19 Modeling
January 5, 2021

Presentation available at: dfr.vermont.gov
350,000+ Deaths
In the United States

First 50,000 Deaths ~55 Days
Second 50,000 Deaths ~30 Days
Third 50,000 Deaths ~66 Days
Fourth 50,000 Deaths ~55 Days
Fifth 50,000 Deaths ~61 Days
Sixth 50,000 Deaths ~23 Days
Seventh 50,000 Deaths ~21 Days

Source: Johns Hopkins University—January 4, 2021
Daily COVID-19 Infections in US (7-Day Average)

- 214,000 Daily Infections
- 66,500 Daily Infections
- 32,000 Daily Infections

Source: Covid Tracking Project—January 5, 2021
COVID-19 Hospitalizations in US (7-Day Average)

Source: Covid Tracking Project—January 5, 2021; includes suspected/PUIs
Daily COVID-19 Deaths in US (7-Day Average)

Source: Covid Tracking Project—January 5, 2021
Regional Case Growth

20.02% Increase in New Confirmed Cases

Positive Cases Dec. 22nd to Dec. 28th

<table>
<thead>
<tr>
<th>State</th>
<th>New Cases Last 7 Days</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vermont</td>
<td>586</td>
</tr>
<tr>
<td>Maine</td>
<td>3043</td>
</tr>
<tr>
<td>New Hampshire</td>
<td>4705</td>
</tr>
<tr>
<td>Rhode Island</td>
<td>5442</td>
</tr>
<tr>
<td>Connecticut</td>
<td>13823</td>
</tr>
<tr>
<td>Quebec</td>
<td>15827</td>
</tr>
<tr>
<td>Massachusetts</td>
<td>27914</td>
</tr>
<tr>
<td>New York</td>
<td>75503</td>
</tr>
</tbody>
</table>

Total: 146,843

Positive Cases Dec. 29th to Jan. 4th

<table>
<thead>
<tr>
<th>State</th>
<th>New Cases Last 7 Days</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vermont</td>
<td>746</td>
</tr>
<tr>
<td>Maine</td>
<td>3659</td>
</tr>
<tr>
<td>New Hampshire</td>
<td>4876</td>
</tr>
<tr>
<td>Rhode Island</td>
<td>6944</td>
</tr>
<tr>
<td>Connecticut</td>
<td>13591</td>
</tr>
<tr>
<td>Quebec</td>
<td>17931</td>
</tr>
<tr>
<td>Massachusetts</td>
<td>32691</td>
</tr>
<tr>
<td>New York</td>
<td>95810</td>
</tr>
</tbody>
</table>

Total: 176,248

Sources: State Health Departments & CTV National News (Quebec)
Northeast Case Growth By Week Since March 16, 2020

Large Weekly Percentage Increase
Most Regional Cases by Week

Sources: State Health Departments & CTV National News (Quebec)
Reduction in Regional Testing

14% Reduction in Testing Over the Holidays

Source: Covid Tracking Project (7 Day Average of PCR Testing in CT, ME, MA, NH, NY, RI & VT)—January 4, 2021
Regional Positivity Rate Trending Up

Source: Covid Tracking Project (7 Day Average in CT, ME, MA, NH, NY, RI & VT)—January 4, 2021
Regional Hospitalizations

85% Since December 1st
13% Since December 25th

Source: Covid Tracking Project (CT, ME, MA, NH, NY, RI & VT)—January 4, 2021
Out-of-State Visitors to Vermont

Estimate of visitors uses 7-day average # mobile devices from out of state (3/1/2019 - 12/31/2020)

Travel down ~50%
But more out-of-state visitors to Vermont than at any point during the pandemic

Holiday & Ski Travel

- Memorial Day
- Fourth of July
- Labor Day
- Indigenous Peoples Day
- Thanksgiving
Daily COVID-19 Infections in Vermont (7 Day Average)

Source: Vermont Department of Health—January 5, 2021
Vermonters Diagnosed with COVID-19 by Week

Source: Vermont Department of Health (week calculated as Tuesday to Monday)
Vermont COVID-19 Cases

7 Day Average Trend Back Up

Source: Vermont Department of Health
Vermont COVID-19 Positivity Rate

7 Day Average is Trending Higher

Source: Vermont Department of Health
Vermont COVID-19 Fatalities

149 Deaths

Source: Vermont Department of Health
Regional Heat Map

Active Cases per Million

Regional Map as of January 5th

10 Lowest Counties in Region by Active Cases Per Million

1) Lamoille (VT): 990
2) Orleans (VT): 1,069
3) Essex (VT): 1,087
4) Washington (VT): 1,178
5) Waldo (ME): 1,186
6) Orange (VT): 1,567
7) Grand Isle (VT): 1,732
8) Caledonia (VT): 1,877
9) Fairfax (VA): 1,968
10) Lincoln (ME): 1,978

Vermont Forecast

Today: 11 days since Christmas
Vermont COVID-19 Hospitalizations

Medical/Surgical Beds
7 Day Average is Stable

ICU Beds
7 Day Average is Stable

Source: Vermont Department of Health
Hospital & ICU Capacity Forecasts

Vermont Hospital Forecast
Medical-Surgical Beds

Vermont ICU Forecast

Source: Oliver Wyman Forecast Model—January 4, 2020; assumes conservative but plausible flu scenario; GNYHA Hospital Surge framework
### Measuring Vermont's Pandemic Response

<table>
<thead>
<tr>
<th>Rank</th>
<th>Positivity (7 Day Avg.)</th>
<th>Cases (7 Day Moving Avg.)</th>
<th>Hospitalizations (7 Day Moving Avg.)</th>
<th>Fatalities (7 Day Moving Avg.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>North Dakota</td>
<td>Hawaii</td>
<td>Hawaii</td>
<td>Hawaii</td>
</tr>
<tr>
<td>2</td>
<td>Hawaii</td>
<td><strong>Vermont</strong></td>
<td><strong>Vermont</strong></td>
<td><strong>Vermont</strong></td>
</tr>
<tr>
<td>3</td>
<td><strong>Vermont</strong></td>
<td>Oregon</td>
<td>Oregon</td>
<td>Maine</td>
</tr>
<tr>
<td>4</td>
<td>Alaska</td>
<td>Minnesota</td>
<td>North Dakota</td>
<td>Alaska</td>
</tr>
<tr>
<td>5</td>
<td>Maine</td>
<td>Michigan</td>
<td>Alaska</td>
<td>Oregon</td>
</tr>
<tr>
<td>6</td>
<td>District of Columbia</td>
<td>North Dakota</td>
<td>Maine</td>
<td>Utah</td>
</tr>
<tr>
<td>7</td>
<td>Wyoming</td>
<td>District of Columbia</td>
<td>Minnesota</td>
<td>Washington</td>
</tr>
<tr>
<td>8</td>
<td>Minnesota</td>
<td>Washington</td>
<td>Washington</td>
<td>New Hampshire</td>
</tr>
</tbody>
</table>

Source: Covid Tracking Project—January 5, 2021
At 2,557 doses administered per 100K residents, Vermont ranks:

- 1st in Northeast
- 2nd in travel region behind West Virginia

Source: CDC—January 4, 2021
### Active Outbreaks in Long Term Care Facilities

<table>
<thead>
<tr>
<th>Facility Name</th>
<th>Total COVID-19 Cases</th>
<th>Change from Prior Week</th>
</tr>
</thead>
<tbody>
<tr>
<td>Elderwood at Burlington, <em>Burlington</em></td>
<td>125</td>
<td>0</td>
</tr>
<tr>
<td>Saint Albans Healthcare &amp; Rehab Center, <em>Saint Albans</em></td>
<td>87</td>
<td>0</td>
</tr>
<tr>
<td>Our Lady of Providence, <em>Winooski</em></td>
<td>49</td>
<td>+2</td>
</tr>
<tr>
<td>Berlin Health &amp; Rehab, <em>Berlin</em></td>
<td>34</td>
<td>0</td>
</tr>
<tr>
<td>Craftsbury Community Care Center, <em>Craftsbury</em></td>
<td>29</td>
<td>+1</td>
</tr>
<tr>
<td>The Residence at Shelburne Bay, <em>Shelburne</em></td>
<td>25</td>
<td>+16</td>
</tr>
<tr>
<td>Converse Home Assisted Living, <em>Burlington</em></td>
<td>17</td>
<td>+2</td>
</tr>
<tr>
<td>Holiday House, <em>Saint Albans</em></td>
<td>16</td>
<td>+16 (new)</td>
</tr>
<tr>
<td>Residence at Quarry Hill, <em>South Burlington</em></td>
<td>12</td>
<td>0</td>
</tr>
<tr>
<td>Holton Home, <em>Brattleboro</em></td>
<td>11</td>
<td>+3</td>
</tr>
<tr>
<td>Cathedral Square, <em>Burlington</em></td>
<td>7</td>
<td>0</td>
</tr>
<tr>
<td>Vermont Veterans Home, <em>Bennington</em></td>
<td>6</td>
<td>+6 (new)</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>451</strong>*</td>
<td><strong>+46</strong>*</td>
</tr>
</tbody>
</table>

*privacy suppressions include facility w/ <25 staff and residents and/or >75% of facility infected -- count included in total cases*
Covid-19 Cases in K-12 Public Schools Across Northern New England

**Vermont**
275 Cases (+10)
149 Schools (+2)

**New Hampshire**
1464 Cases (+149)
379 Schools (+9)

**Maine**
1,251 Cases (+301)
222 Schools (+21)

Source: ME, NH & VT K-12 Dashboards, ME media reports
Flu vaccinations up 11% from same time last season

2019-2020 Actual

270,275

Year to Date

244,070

2020-2021 Goal

325,000

270,842

Year to Date

83% to 2020-2021 goal

Data from UVMHN may be incomplete or delayed

Source: Vermont Department of Health & ADS; Immunization Registry; Measured from July 1 to December 27, 2019 & 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

Interpret with caution, there is a chance for over or underestimation given the lag in reporting.

Source: Vermont Department of Health—January 5, 2021
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—January 5, 2021
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—January 5, 2021
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—January 5, 2021
Vermont Testing

7-Day Rolling Test Average

Drop following Thanksgiving & campus closures

Source: Vermont Department of Health—January 5, 2021; results reported to VDH daily