COVID-19 Modeling
December 22, 2020

Presentation available at:
dfr.vermont.gov
Week Over Week Change in COVID Infections
Regional Case Growth

4.39% Decrease in New Confirmed Cases

Positive Cases Dec. 8th to Dec. 14th

<table>
<thead>
<tr>
<th>State</th>
<th>Cases Last 7 Days</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vermont</td>
<td>774</td>
</tr>
<tr>
<td>Maine</td>
<td>2575</td>
</tr>
<tr>
<td>New Hampshire</td>
<td>6673</td>
</tr>
<tr>
<td>Rhode Island</td>
<td>7934</td>
</tr>
<tr>
<td>Quebec</td>
<td>12359</td>
</tr>
<tr>
<td>Connecticut</td>
<td>18148</td>
</tr>
<tr>
<td>Massachusetts</td>
<td>33124</td>
</tr>
<tr>
<td>New York</td>
<td>71075</td>
</tr>
</tbody>
</table>

Positive Cases Dec. 15th to Dec. 21st

<table>
<thead>
<tr>
<th>State</th>
<th>Cases Last 7 Days</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vermont</td>
<td>685</td>
</tr>
<tr>
<td>Maine</td>
<td>2980</td>
</tr>
<tr>
<td>New Hampshire</td>
<td>4735</td>
</tr>
<tr>
<td>Rhode Island</td>
<td>6068</td>
</tr>
<tr>
<td>Quebec</td>
<td>13558</td>
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<tr>
<td>Connecticut</td>
<td>13385</td>
</tr>
<tr>
<td>Massachusetts</td>
<td>31704</td>
</tr>
<tr>
<td>New York</td>
<td>72845</td>
</tr>
</tbody>
</table>

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

Broke 16 Week Trend of Increasing Regional Case Growth

Sources: State Health Departments & CTV National News (Quebec)
Northeast Case Growth By Week
Since October 12, 2020

Sources: State Health Departments & CTV National News (Quebec)
Northeast COVID-19 Positivity Rate

Trending Up

Source: Covid Tracking Project - 7 Day Average (Includes CT, MA, ME, NH, NY, RI and VT)
Northeast COVID-19 Hospitalizations

Trending Flat

Source: Covid Tracking Project - 7 Day Average (Includes CT, MA, ME, NH, NY, RI and VT)
Daily COVID-19 Infections in Vermont (7 Day Average)

Sources: Vermont Department of Health
Vermonters Diagnosed with COVID-19 by Week

Source: Vermont Department of Health (week calculated as Tuesday to Monday)
Active COVID-19 Infections in Vermont Counties

Calculated using the DFR active case algorithm

Thanksgiving Day

Bennington
Chittenden
All Other Vermont Counties

Travel Map Thresholds

Nov 01 08 15 22 29 06 13 20
Dec
Regional Heat Map

Active Cases per Million

Regional Map as of December 22nd

10 Lowest Counties in Region by Active Cases Per Million

1) Addison (VT): 928
2) Grand Isle (VT): 1,495
3) Washington (VT): 1,813
4) Rutland (VT): 1,859
5) Falls Church (VA): 1,973
6) Orange (VT): 2,093
7) Lamoille (VT): 2,126
8) Windsor (VT): 2,163
9) Essex (VT): 2,255
10) Knox (ME): 2,390

COVID-19 Deaths by Week In Vermont

111 Deaths

Source: Johns Hopkins University (Deaths as reported by week calculated as Wednesday to Tuesday)
## 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, Burlington</td>
<td>123</td>
<td>+7</td>
</tr>
<tr>
<td>Saint Albans Healthcare &amp; Rehab Center, Saint Albans</td>
<td>85</td>
<td>+22</td>
</tr>
<tr>
<td>Rutland Health &amp; Rehab, Rutland</td>
<td>67</td>
<td>+1</td>
</tr>
<tr>
<td>Our Lady of Providence, Winooski</td>
<td>43</td>
<td>+21</td>
</tr>
<tr>
<td>Four Seasons Care Home, Northfield</td>
<td>41</td>
<td>0</td>
</tr>
<tr>
<td>Berlin Health &amp; Rehab, Berlin</td>
<td>34</td>
<td>0</td>
</tr>
<tr>
<td>Craftsbury Community Care Center, Craftsbury</td>
<td>17</td>
<td>+17 (New)</td>
</tr>
<tr>
<td>Converse Home Assisted Living, Burlington</td>
<td>14</td>
<td>+3</td>
</tr>
<tr>
<td>Residence at Quarry Hill, South Burlington</td>
<td>12</td>
<td>+1</td>
</tr>
<tr>
<td>Cathedral Square, Burlington</td>
<td>7</td>
<td>+7 (New)</td>
</tr>
<tr>
<td>Holton Home, Brattleboro</td>
<td>6</td>
<td>+6 (New)</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>485</strong></td>
<td><strong>+121</strong></td>
</tr>
</tbody>
</table>

Source: Vermont Department of Health - December 14, 2020 (reporting Monday through previous Sunday); ‘Active’ defined as less than 28 days since most recent case’s specimen collection date or illness start date (whichever is later); facility name w/ <25 staff and residents suppressed but count included in total cases.
Daily COVID Deaths in VT (14-Day Average)

Source: VDH
Out-of-State Visitors to Vermont

Estimate of visitors uses 7-day average # mobile devices from out of state (3/1/2019 - 12/16/2020)

2019 Christmas, New Years & Ski Travel

- Memorial Day
- Fourth of July
- Labor Day
- Indigenous Peoples Day
- Thanksgiving
Forecasted **34% increase** in new cases over the next four weeks.
Covid-19 Cases in K-12 Public Schools Across Northern New England

New Hampshire
1,185 Cases (+162)
334 Schools (+22)

Vermont
232 Cases (+37)
133 Schools (+15)

Maine
939 Cases (+288)
199 Schools (+25)

Source: ME, NH & VT K-12 Dashboards and ME media reports
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—December 22, 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—December 22, 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—December 22, 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—December 22, 2020
Vermont Testing

7-Day Rolling Test Average

Drop following Thanksgiving & campus closures

Source: Vermont Department of Health—December 22, 2020; results reported to VDH daily

*Data from UVMHN may be incomplete or delayed
Vermont Flu Season Modeling

**Current hospitalizations under 4 selected scenarios, reflective of vaccination**

- **Highly pessimistic**: Total: 575, Peak\(^1\): 38
- **Plausible but conservative**: Total: 249, Peak\(^1\): 17
- **Plausible but optimistic**: Total: 113, Peak\(^1\): 8
- **Optimistic**: Total: 51, Peak\(^1\): 4

Source: Oliver Wyman modeling -- Fall/Winter 2020; \(^1\)rounded to full number
Flu vaccinations up 11% from same time 2019*

2019 Actual
270,275

Year to Date
235,021

2020 Goal
325,000

Year to Date
260,955*

80%* to 2020 goal

*Data from UVMHN may be incomplete or delayed

Source: Vermont Department of Health & ADS; Immunization Registry; Measured from July 1 to December 13, 2019 & 2020
Vermont Hospital Forecast
Medical-Surgical Beds

- Medical Surgical Beds baseline occupancy
- Medical Surgical Beds + COVID
- Medical Surgical Beds - Baseline + COVID + Flu
- Current Total Medical Surgical Capacity
- Elevated Medical Surgical Level

85% occupancy
100% occupancy

Source: Oliver Wyman Forecast Model - December 21, 2020; assumes conservative but plausible flu scenario; uses GNYHA'S Hospital Surge framework
Vermont ICU Forecast

- **ICU bed baseline occupancy**
- **ICU beds baseline + COVID**
- **ICU beds baseline + COVID + Flu**
- **Elevated ICU bed level**
- **Total current ICU capacity**

100% occupancy

90% occupancy

Source: Oliver Wyman Forecast Model - December 21, 2020; assumes conservative but plausible flu scenario