COVID-19 Modeling
September 14, 2021

Presentation available at: dfr.vermont.gov
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Vermont Case Data
Vermont COVID-19 Case Growth

Source: Vermont Dept. of Health—September 13, 2021
Vermonters Diagnosed with COVID-19 by Week

Source: Vermont Department of Health (week calculated as Tuesday to Monday)
Growth rate trending down in recent weeks & declined for first time this week

Source: Vermont Dept. of Health—September 14, 2021
COVID-19 $R_t$ in Vermont

Source: Covidestim—Covid-19 Nowcasting—September 14, 2021
Estimated vs Detected COVID-19 Cases in Vermont

This figure shows both the number of detected cases (gray) and an estimate of the true number of infections.

Source: Covidestim—Covid-19 Nowcasting—September 14, 2021
Vermont Covid-19 Cases (Raw Count 7-Day Average)

Source: Vermont Dept. of Health—September 11, 2021; not fully vaccinated population includes children 0-11 & eligible unvaccinated adults; population estimates using 2019 US census data

Fully vaccinated VT population more than 2x larger than those not fully vaccinated
The unvaccinated case rate has increased 7% over the last 7 days.

The vaccinated rate has decreased 2% over the same period.
Vermont COVID-19 Hospitalizations

New Daily Hospital Admissions Per 100K (14-Day Average)

- Not Fully Vaccinated
- Fully Vaccinated

Source: Vermont Dept. of Health and CDC—September 13, 2021
Infections, Hospitalizations, & Deaths by Percentage of State Population Vaccinated

Source: Covid Act Now—September 13, 2021; Measures last 14 days
Active Cases in Vermont Counties

Source: Vermont Dept. of Health—September 12, 2021; DFR Active Case Algorithm (per million)
Age of Infected Vermonters

Median age of COVID positive individuals in VT over the last 14 days.
Vermont Case Rates By Age (7-Day Average)

Source: VDH—September 13, 2021
Covid-19 case rates decreased slightly this past week.

Washington County and Grand Isle saw the largest decreases week over week; Essex and Orleans saw the largest case rate increases.
Active COVID Cases per Million in Vermont Regions

For the purpose of this analysis, Vermont has been split into four regions: **Burlington Metro** (Chittenden, Franklin, Grand Isle), **Northeast Kingdom** (Caledonia, Orleans, Essex), **Central** (Lamoille, Washington, Addison, Orange), and **Southern** (Rutland, Windsor, Bennington, Windham).
## Fall 2021 Higher Education Restart

<table>
<thead>
<tr>
<th>Higher Education Institutions Reporting</th>
<th>Enrollment</th>
<th>Students Fully Vaccinated</th>
<th>Students Not Fully Vaccinated (No Exemption Granted)</th>
<th>Students with Unknown Vaccine Status</th>
<th>Students Granted Vaccine Mandate Exemption</th>
</tr>
</thead>
<tbody>
<tr>
<td>16 of 16</td>
<td>28,744</td>
<td>26,892</td>
<td>480</td>
<td>668</td>
<td>704</td>
</tr>
<tr>
<td></td>
<td></td>
<td>93.6%</td>
<td>1.7%</td>
<td>2.3%</td>
<td>2.4%</td>
</tr>
</tbody>
</table>

### Test Results

- **Week 1:** 37 positive cases out of 12,623 tests
- **Week 2:** 36 positive cases out of 7,434 tests
- **Week 3:** 43 positive cases out of 3,053 tests

Source: Vermont Higher Education Institutions—September 13, 2021
Vermont K-12 Cases By Semester

- **Fall 2020**
- **Spring 2021**
- **Fall 2021**

<table>
<thead>
<tr>
<th>Week</th>
<th>Fall 2020</th>
<th>Spring 2021</th>
<th>Fall 2021</th>
</tr>
</thead>
<tbody>
<tr>
<td>Week 1</td>
<td>4</td>
<td>29</td>
<td>41</td>
</tr>
<tr>
<td>Week 2</td>
<td>0</td>
<td>52</td>
<td>40</td>
</tr>
<tr>
<td>Week 3</td>
<td>0</td>
<td>50</td>
<td>78</td>
</tr>
</tbody>
</table>

Source: VDH—September 13, 2021
# Active Outbreaks in Long Term Care Facilities

<table>
<thead>
<tr>
<th>Facility Name</th>
<th>Total COVID-19 Cases</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cedar Hill Skilled Nursing Facility, Windsor</td>
<td>30</td>
</tr>
<tr>
<td>Vernon Green Nursing Home, Vernon</td>
<td>28</td>
</tr>
<tr>
<td>Ethan Allen Residence, Burlington</td>
<td>25</td>
</tr>
<tr>
<td>Vermont Veterans Home, Bennington</td>
<td>16</td>
</tr>
<tr>
<td>Green Mountain Nursing and Rehab, Colchester</td>
<td>12</td>
</tr>
<tr>
<td>Mansfield Place, Essex</td>
<td>12</td>
</tr>
<tr>
<td>Vernon Hall Assisted Living, Vernon</td>
<td>11</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>134</strong></td>
</tr>
</tbody>
</table>

Source: Vermont Department of Health—September 13, 2021 (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); *privacy suppressions include facility w/ <25 staff and residents and/or >75% of facility infected
VT Weekly COVID-19 Infections Forecast

Calculated as a 7-day sum. Gray bands represent 50% and 95% confidence intervals. Since projections are only released once a week, the actual number may appear to over or undershoot the forecast.

Source: CDC Ensemble Model—September 14, 2021
Vermont Hospitalization Data
Statewide Covid-19 Hospitalizations

Hospitalization rate increasing, but Vermont continues to have fewest hospitalizations per capita nationally

On average, 71% of all recent hospitalizations among the unvaccinated

Source: Vermont Department of Health—September 13, 2021
On average, 79% of all recent critical care stays among the unvaccinated
New Hospitalizations per 100,000 Residents, by Age

Source: US Dept. of Health & Human Services; 7-day average - September 14, 2021
Vermont Fatality Data
Weekly Covid-19 Deaths In Vermont

Source: Vermont Department of Health—September 13, 2021 (week ending)
Monthly Covid-19 Deaths In Vermont

Source: Vermont Department of Health—September 13, 2021; deaths attributed to month in which death occurred rather than reported
VT Weekly COVID-19 Deaths Forecast

Calculated as a 7-day sum. Gray bands represent 50% and 95% confidence intervals. Since projections are only released once a week, the actual number may appear to over or undershoot the forecast.
Vermont Vaccination Data
Vermont Vaccination

87.0%
Of Eligible Vermonters Have Started Vaccination

+2,243
Since Last Week

479,261
Vermonters with at Least 1 Dose

71,689
Eligible Vermonters still to be vaccinated

Source: CDC—September 13, 2021
Vermont CDC Vaccine Scorecard

<table>
<thead>
<tr>
<th>Metric</th>
<th>Figure</th>
<th>State Ranking</th>
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<tbody>
<tr>
<td>Doses Administered per 100K</td>
<td>141,786</td>
<td>1</td>
</tr>
<tr>
<td>% At Least 1 Dose (Eligible Population)</td>
<td>87.0%</td>
<td>3</td>
</tr>
<tr>
<td>% Fully Vaccinated (Eligible Population)</td>
<td>77.8%</td>
<td>1</td>
</tr>
<tr>
<td>% At Least 1 Dose (Full Population)</td>
<td>76.9%</td>
<td>1</td>
</tr>
<tr>
<td>% Fully Vaccinated (Full Population)</td>
<td>68.7%</td>
<td>1</td>
</tr>
<tr>
<td>% Fully Vaccinated (65 &amp; Over)</td>
<td>94.9%</td>
<td>1</td>
</tr>
</tbody>
</table>

Source: CDC—September 13, 2021
Vermont is 1st in the Country in Vaccines Administered Per 100K

Source: CDC—September 13, 2021
87.0% of Eligible Vermonters Have Started Vaccination, Placing Vermont 3rd Nationally

Source: CDC—September 13, 2021
77.8% of Eligible Vermonters Are Fully Vaccinated, Placing Vermont 1st Nationally

Source: CDC—September 13, 2021
76.9% of Vermonters Have Started Vaccination, Placing Vermont 1st Nationally

Source: CDC—September 13, 2021
68.7% of Vermonters Fully Vaccinated, Placing Vermont 1st Nationally

Source: CDC—September 13, 2021
94.9% of 65 & Over Vermonters Fully Vaccinated, Placing Vermont 1st Nationally

Source: CDC—September 13, 2021
Vermonters initiating vaccination decreased 11.2% in the last week.
Vermont Vaccination Progress

By Age Band

- Partially Vaccinated
- Fully Vaccinated

Source: Vermont Dept. of Health—September 13, 2021; *based on 2019 census estimates; state data may differ from CDC reporting
Regional Data
Regional Cases

3.0% Increase in New Cases

New Cases August 31st to September 6th

New Cases September 7th to September 13th

Sources: State Health Departments & CTV National News (Quebec)
Change in Northeast Regional Weekly Case Growth

Source: State Health Departments & CTV National News (Quebec)
Weekly Regional Cases

Sources: State Health Departments & CTV National News (Quebec) (includes: CT, ME, MA, NH, NY, QC, RI & VT)
National Data
Change in National Weekly Case Growth

Source: CDC, NYT, & Covid Tracking Project
US Weekly COVID-19 Infections Forecast

Calculated as a 7-day sum. Gray bands represent 50% and 95% confidence intervals. Since projections are only released once a week, the actual number may appear to over or undershoot the forecast.
National COVID-19 Hospitalizations

-1.6% Decrease
Over the last 7 days

Source: Covid Tracking Project; NYT & CDC—September 13, 2021
Percent of All Hospital Beds Used for COVID-19

Vermont has the lowest percentage of hospital beds in use for Covid-19 in US

Source: HHS—September 13, 2021
National COVID-19 Deaths
(Caution: Labor Day Related Data Anomalies)

+18.8% Increase
Over the last 7 days

Source: Covid Tracking Project; NYT & CDC—September 13, 2021
US Weekly COVID-19 Deaths Forecast

Calculated as a 7-day sum. Gray bands represent 50% and 95% confidence intervals. Since projections are only released once a week, the actual number may appear to over or undershoot the forecast.
RESTART VERMONT

Reopening Metrics

1. Syndromic Surveillance (*retired*)
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

Vermont Department of Health no longer updating syndromic surveillance on a weekly basis.
Viral Growth & Reproductive Rates

Vermont Coronavirus Growth Rate

- Rolling 3-Day Avg % Growth
- Rolling 7-Day Avg % Growth

Source: Vermont Department of Health
Hospital & Critical Care Beds

ICU Use & Capacity

Source: Vermont Department of Health
Vermont Testing

Source: Vermont Department of Health; results reported to VDH daily