COVID-19 Modeling
December 21, 2021

Presentation available at: dfr.vermont.gov
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COVID-19 Variant Data
CDC estimates **73.2%** of recent Covid-19 cases in the United State are the Omicron variant.
Omicron exceeded 70% of US cases in 4 weeks compared to 8 weeks for Delta.
Vermont Case Data
Vermont cases have decreased 1.3% over last 7 days & decreased 16% over last 14 days.
Week-over-week testing decreased slightly, with the 7-day average decreasing 0.9% this week.
Test positivity was flat, **decreasing 0.4%** over the last 7 days.
Vermont Case Growth Metrics

1.3% Decrease
Over last 7 days

0.9% Decrease
Over last 7 days

0.4% Decrease
Over last 7 days

Source: VDH—December 21, 2021; created with Datawrapper
The not fully vaccinated case rate has **decreased 0.7%** in the last 7 days.

The fully vaccinated rate has **decreased 1%** during the same period.

Source: Vermont Dept. of Health and CDC—December 20, 2021
Those 65+ & **not fully vaccinated** are significantly more likely to be hospitalized, especially compared to those **fully vaccinated & boosted**.

- **Not Fully Vaccinated**: 564 hospitalizations per 100K
- **Fully Vaccinated But Not Boosted**: 117 hospitalizations per 100K
- **Fully Vaccinated & Boosted**: 16 hospitalizations per 100K

Source: VDH & CDC—December 20, 2021; Created with Datawrapper
Those 18-64 & **not fully vaccinated** were **46x more** likely to be hospitalized from COVID-19 over last 6 weeks compared to those **fully vaccinated & boosted**.
COVID-19 Deaths By Vaccination Status Per 100K

Measured Among Vermont's 18 & Over Population Over the Last 6 Weeks

Those 18+ & not fully vaccinated were **30x more** likely to die from COVID-19 over last 6 weeks compared to those fully vaccinated & boosted

- **39 Deaths per 100K**
- **12 Deaths per 100K**
- **1.3 Deaths per 100K**

Source: VDH & CDC—December 20, 2021; Created with Datawrapper
Vermont reported **107 fewer cases** this week compared to last week.
Over the last 7 days, cases have:

- **Decreased 4%** for ages **0 to 24**
- **Decreased 0.4%** for ages **25 to 49**
- **Decreased 14%** for ages **50 to 64**
- **Decreased 1%** for ages **65+**
Vermont had the 16th-highest rate of new COVID-19 cases over the last week.
Vermont had the highest rate of COVID-19 testing over the last week.
Active Cases in Vermont Counties

Source: JHU—December 21, 2021; DFR Active Case Algorithm (per million)
Vermont COVID-19 cases are not expected to decrease over next 4 weeks

Anticipating cases to increase after Christmas & New Year’s & with Omicron variant

Source: Johns Hopkins University & CDC—December 21, 2021
Vermont COVID-19 fatalities are not expected to decrease over next 4 weeks.
Age of Infected Vermonters

Median age of COVID positive individuals in VT over the last 14 days.

Source: VDH—December 21, 2021; created with Datawrapper
VT COVID-19 Infections per 100K by Age Group

Source: VDH—December 21, 2021; created with Datawrapper
Vermont Covid-19 Case Rates by Age (7-Day Average)

Source: VDH—December 21, 2021; created with Datawrapper
Median Age of VT Breakthrough Infections by Month

<table>
<thead>
<tr>
<th>Month</th>
<th>Median Age</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jul 2021</td>
<td>45</td>
</tr>
<tr>
<td>Aug</td>
<td>49</td>
</tr>
<tr>
<td>Sep</td>
<td>49</td>
</tr>
<tr>
<td>Oct</td>
<td>48</td>
</tr>
<tr>
<td>Nov</td>
<td>47</td>
</tr>
<tr>
<td>Dec</td>
<td>41</td>
</tr>
</tbody>
</table>

Source: Vermont Dept. of Health—December 21, 2021; created with Datawrapper
Vermont Case Rate & Vaccination by Age Band

Source: VDH—December 21, 2021
Vermont Case Rate & Vaccination by Age Band

Source: VDH—December 21, 2021
Case rates **decreased in 9 of 14** counties this week

Bennington & Rutland Counties reporting highest levels of spread statewide
Active Cases per Million in Vermont Regions

Source: JHU & DFR Active Case Algorithm—December 21, 2021
## 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>28,586</td>
<td>27,201</td>
<td>255</td>
<td>445</td>
<td>685</td>
</tr>
<tr>
<td></td>
<td></td>
<td>95.2%</td>
<td>0.9%</td>
<td>1.6%</td>
<td>2.4%</td>
</tr>
</tbody>
</table>

Week 1: **37 cases** out of 12,623 tests  
Week 2: **36 cases** out of 7,434 tests  
Week 3: **43 cases** out of 3,053 tests  
Week 4: **65 cases** out of 6,497 tests  
Week 5: **36 cases** out of 4,878 tests  
Week 6: **19 cases** out of 4,516 tests  
Week 7: **27 cases** out of 3,536 tests  
Week 8: **63 cases** out of 3,668 tests  
Week 9: **65 cases** out of 4,398 tests  
Week 10: **53 cases** out of 4,575 tests  
Week 11: **132 cases** out of 8,404 tests  
Week 12: **60 cases** out of 6,048 tests  
Week 13: **55 cases** out of 6,029 tests  
Week 14: **17 cases** out of 2,066 tests  
Week 15: **63 cases** out of 8,141 tests  
Week 16: **104 cases** out of 6,079 tests  
Week 17: **50 cases** out of 6,203 tests

Source: Vermont Higher Education Institutions—December 20, 2021
Vermont Higher Education Cases By Semester

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

Source: Vermont Higher Education Institutions—December 20, 2021—Created with Datawrapper; * During the Fall 2020 semester Week 1 started later than Spring and Fall 2021 and therefore reached Thanksgiving Break by Week 11.
### Vermont Higher Education Comparison

<table>
<thead>
<tr>
<th></th>
<th>Spring Semester 2021</th>
<th>Fall Semester 2021</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Enrollment</strong></td>
<td>~20,500</td>
<td>~28,500</td>
</tr>
<tr>
<td><strong>VT Cases During Semester</strong></td>
<td>13,653</td>
<td>29,606</td>
</tr>
<tr>
<td><strong># of Cases</strong></td>
<td>1,167</td>
<td>896</td>
</tr>
<tr>
<td><strong>% of VT’s Cases</strong></td>
<td>8.5%</td>
<td>3.0%</td>
</tr>
<tr>
<td><strong># of Tests</strong></td>
<td>379,224</td>
<td>98,148</td>
</tr>
</tbody>
</table>
# 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>Burlington Health &amp; Rehabilitation</td>
<td>23</td>
</tr>
<tr>
<td>Springfield Rivers Nursing &amp; Rehabilitation</td>
<td>Not Shown</td>
</tr>
<tr>
<td>St. Johnsbury Health &amp; Rehabilitation</td>
<td>Not Shown</td>
</tr>
<tr>
<td>Thompson House, <em>Brattleboro</em></td>
<td>Not Shown</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>23</strong></td>
</tr>
</tbody>
</table>

Source: Vermont Department of Health—December 21, 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.
Vermont Hospitalization Data
Statewide Covid-19 Hospitalizations

- **23% Decrease** in the 7-Day hospitalization average over the past week
- **73%** of hospitalizations among the unvaccinated over the last 7 days

Source: Vermont Department of Health—December 21, 2021
Statewide Covid-19 Critical Care Usage

16% Decrease in the 7-Day ICU average over the past week

73% of critical care stays among the unvaccinated over the last 7 days

Source: Vermont Department of Health—December 21, 2021
Vermont Hospital Metrics
(7-Day Averages)

Vermont Hospital Beds Available Since July 1, 2021
Availability **increased 82%** over last 7 days

Vermont ICU Beds Available Since July 1, 2021
Availability **increased 64%** over last 7 days

Source: Vermont Department of Health—December 20, 2021;
Vermont had the 12th-fewest COVID-19 hospital admissions per capita over the last week.

Source: CDC—December 20, 2021; Created with Datawrapper
Vermont Fatality Data
Weekly Covid-19 Deaths In Vermont

Source: Vermont Department of Health—December 21, 2021 (reporting week ending Tuesday to Monday)
Monthly Covid-19 Deaths In Vermont

455 COVID-19 deaths since the start of the pandemic

Source: Vermont Department of Health—December 21, 2021; deaths attributed to month in which death occurred rather than reported
Vermont had the 17th-fewest COVID-19 deaths per capita over the last week.

Source: CDC—December 20, 2021; Created with Datawrapper; Maryland excluded due to inability to report resulting from cyber incident.
### Vermont CDC Vaccine Scorecard

<table>
<thead>
<tr>
<th>Metric</th>
<th>Figure</th>
<th>State Ranking</th>
</tr>
</thead>
<tbody>
<tr>
<td>Doses Administered per 100K</td>
<td>195,467</td>
<td>1</td>
</tr>
<tr>
<td>% At Least 1 Dose (5+ Population)</td>
<td>92.5%</td>
<td>2 (tied)</td>
</tr>
<tr>
<td>% Fully Vaccinated (5+ Population)</td>
<td>80.3%</td>
<td>1</td>
</tr>
<tr>
<td>% At Least 1 Dose (Full Population)</td>
<td>88.2%</td>
<td>2</td>
</tr>
<tr>
<td>% Fully Vaccinated (Full Population)</td>
<td>76.6%</td>
<td>1</td>
</tr>
<tr>
<td>% Fully Vaccinated (65 &amp; Over)</td>
<td>95%+</td>
<td>1</td>
</tr>
</tbody>
</table>

Source: CDC—December 20, 2021; New Hampshire & West Virginia excluded due to unreliable data
Vermont leads the nation with the percentage of 5 to 11 year olds starting vaccination:

53% w/ 1 Dose & 37% Fully Vaccinated

Source: CDC—December 20, 2021; created with Datawrapper
Vermont Vaccination Progress
By Age Band

Source: Vermont Dept. of Health—December 20, 2021; *based on 2019 census estimates; state data may differ from CDC reporting
## Vermont CDC Booster Scorecard

<table>
<thead>
<tr>
<th>Metric</th>
<th>Figure</th>
<th>State Ranking</th>
</tr>
</thead>
<tbody>
<tr>
<td>% of Fully Vaccinated w/ booster dose</td>
<td>45.4%</td>
<td>1</td>
</tr>
<tr>
<td>% of Fully vaccinated 18+ w/ booster doses</td>
<td>50.1%</td>
<td>1</td>
</tr>
<tr>
<td>% of Fully vaccinated 50+ w/ booster doses</td>
<td>62.1%</td>
<td>1</td>
</tr>
<tr>
<td>% of Fully vaccinated 65+ w/ booster doses</td>
<td>72.3%</td>
<td>2</td>
</tr>
</tbody>
</table>

Source: CDC—December 20, 2021
Regional Data
Northeast Regional Cases

41.4% Increase in New Cases

New Cases December 7th to December 13th

New Cases December 14th to December 20th

Sources: State Health Dept. & CTV National News (Quebec)
Weekly Northeast Regional Cases

Most weekly COVID-19 cases reported in Northeast Region ever

Sources: State Health Depts.—December 20, 2021 (includes: CT, ME, MA, NH, NY, QC, RI & VT)
New England COVID-19 Cases Per 100K (7-Day Average)

New England cases **increased 3%** over last 7 days & **increased 22%** over last 14 days

Sources: State Health Depts.—December 20, 2021 (includes: CT, ME, MA, NH, RI & VT)
New England COVID-19 Case Trends

7-Day Average Cases Per 100K

- Massachusetts
- Connecticut
- Rhode Island
- Maine
- New Hampshire
- Vermont

Sources: State Health Depts.—December 20, 2021 (includes: CT, ME, MA, NH, RI & VT)
Case rate differences between Northern and Southern New England have **largely disappeared**

Sources: State Health Depts.—December 20, 2021 (Northern NE includes: ME, NH & VT & Southern NE includes: CT, MA & RI)
National Data
U.S. Infections, Hospitalizations, & Deaths

**Infections**
(7-Day Average)

11.1% Increase
Over last 7 days

**Hospitalizations**
(7-Day Average)

3.7% Increase
Over last 7 days

**Deaths**
(7-Day Average)

0.4% Increase
Over last 7 days

Source: New York Times—December 20, 2021; created with Datawrapper
Infections, Hospitalizations, & Deaths by Percentage of State Population Vaccinated

Source: Covid Act Now—December 21, 2021; 7-day averages; created with Datawrapper
Daily COVID-19 Cases per Million in US Regions

Calculated as a 7-day moving average. Definitions of North, Midwest, South, and West taken from the U.S. Census bureau.

Source: JHU—December 21, 2021; 7-day averages; created with Datawrapper
US COVID-19 Infection Confidence Intervals

Calculated as a 7-day mean. Inner and outer bands represent 50% and 95% confidence intervals, respectively.

Source: CDC—December 21, 2021; created with Datawrapper
US COVID-19 Death Confidence Intervals

Calculated as a 7-day mean. Inner and outer bands represent 50% and 95% confidence intervals, respectively.
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
5. Testing Volume
Viral Growth & Reproductive Rates

Vermont Coronavirus Growth Rate

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

Source: Vermont Department of Health
Test Positivity

Percent Tests Yielding New Positive COVID-19 Cases

Source: Vermont Department of Health; 7-day positivity calculated as positive tests last seven days/tests last seven days
Hospital & Critical Care Beds

ICU Use & Capacity

- Open ICU
- COVID ICU
- non-COVID ICU

% of ICU

Source: Vermont Department of Health
Vermont Testing

Vermont COVID-19 Testing

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