

COVID-19 Modeling

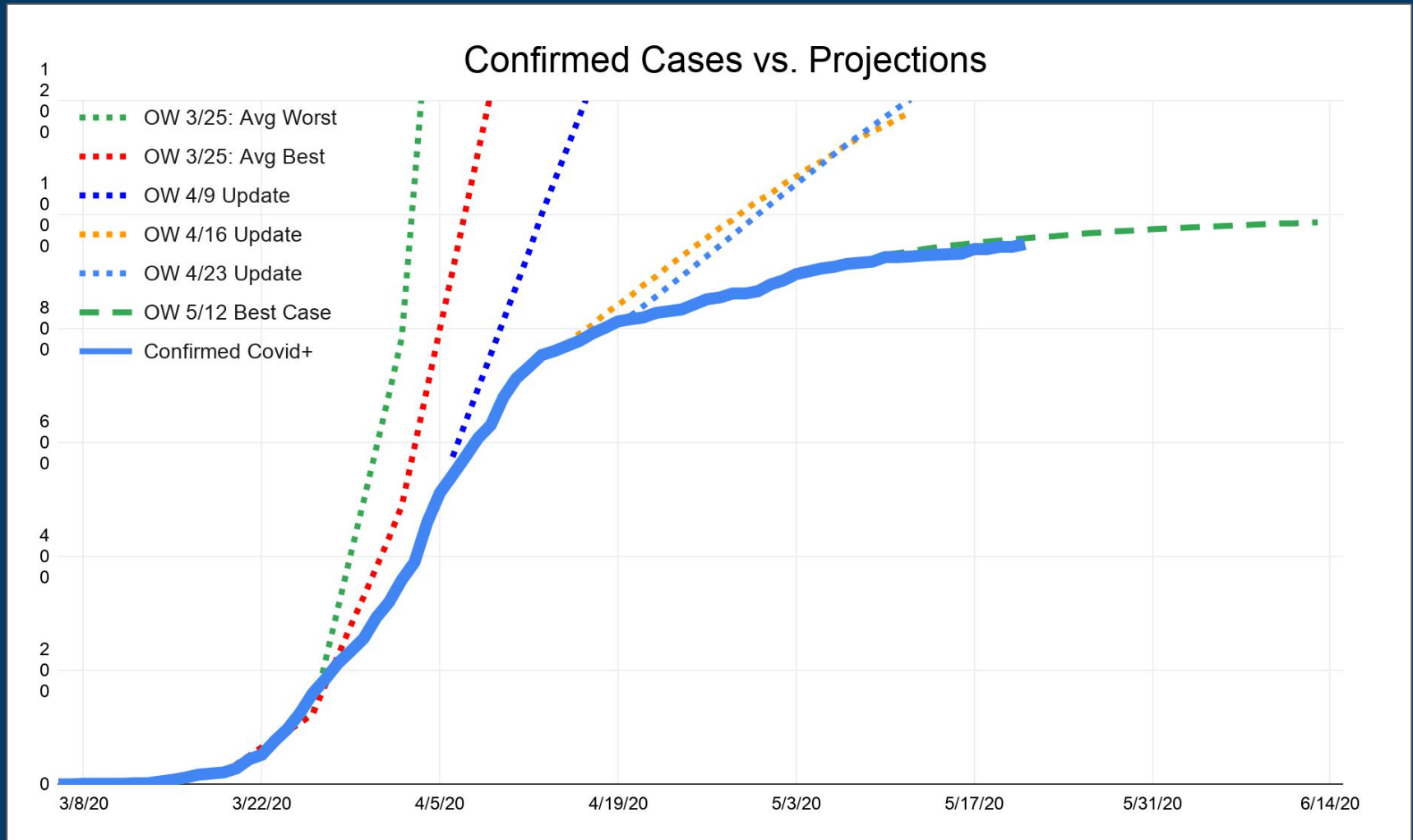
May 22, 2020

Overview

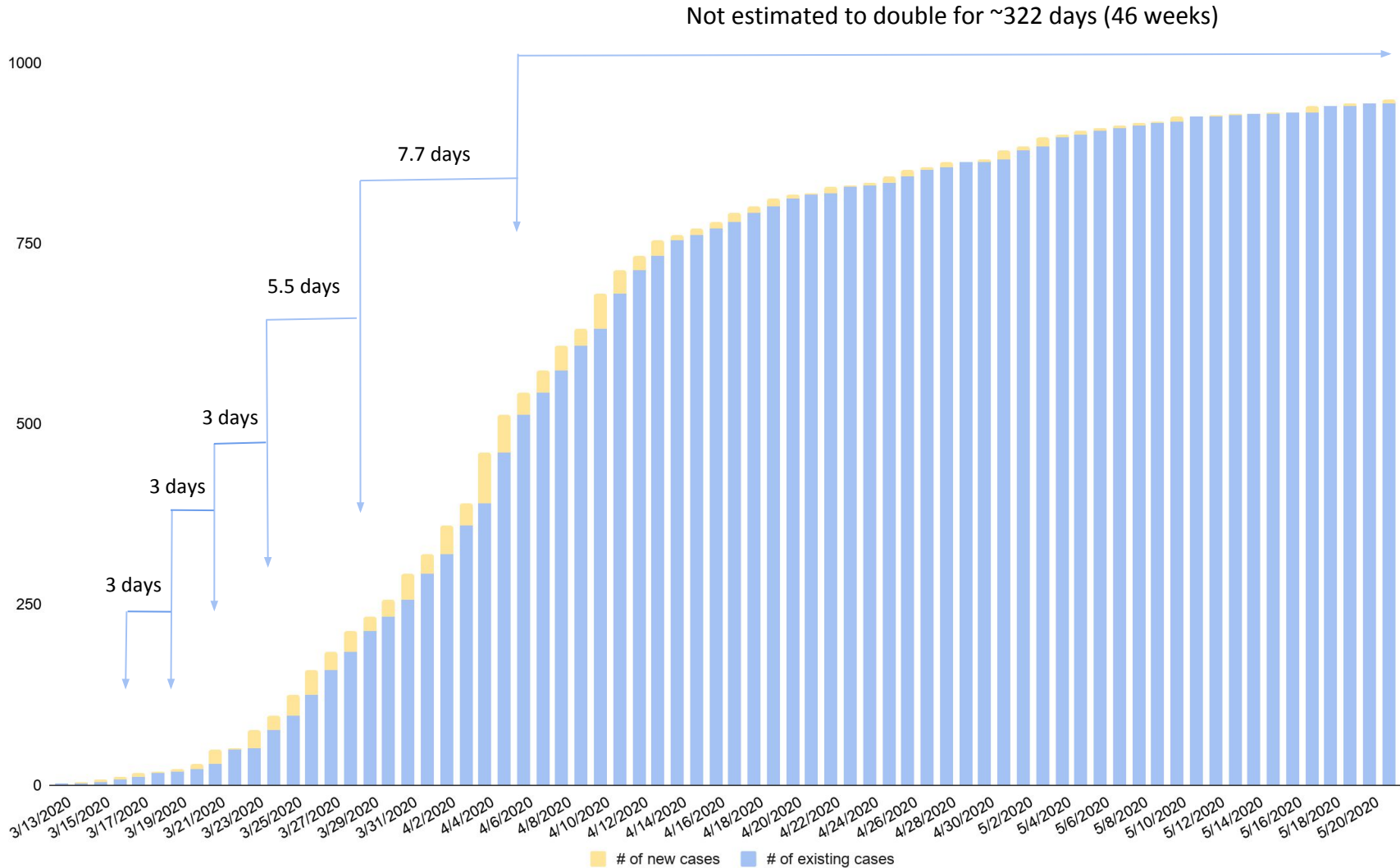
Presentation Updated Through May 22, 2020

- **Goal:** Develop multiple forecasting perspectives
 - Oliver Wyman – Helen Leis and Bruce Hamory
 - Columbia University – Professor Jeffrey Shaman, Ph.D.
 - Northeastern University – Professor Alessandro Vespignani, Ph.D.
 - University of Washington – Institute for Health Metrics and Evaluation (IHME)
 - UVM – Larner College of Medicine – Department of Microbiology & Molecular Genetics – Translational Global Infectious Disease Research (TGIR) Group – John Hanley, PhD
- **Forecasting is imprecise:**
 - Focus on the near term: Forecasting is much less predictable the further out you model
 - Focus on ranges rather than specifics: Forecasts are represented as a range of possible outcomes (i.e., likely, best & worst)
 - Consistent refinement: Continually updating with new data and new assumptions
 - Appropriate Perspective: Ultimately forecasts are developed for planning purposes and are not representative of definitive outcomes
- **Ultimate Purpose of Forecasting:**
 - Phase 1: Medical Surge Planning
 - Phase 2: Support Restart Vermont and Monitor Key Trends
 - Phase 3: Regional Modeling to Support Restart Vermont and Continue Monitoring Key Trends

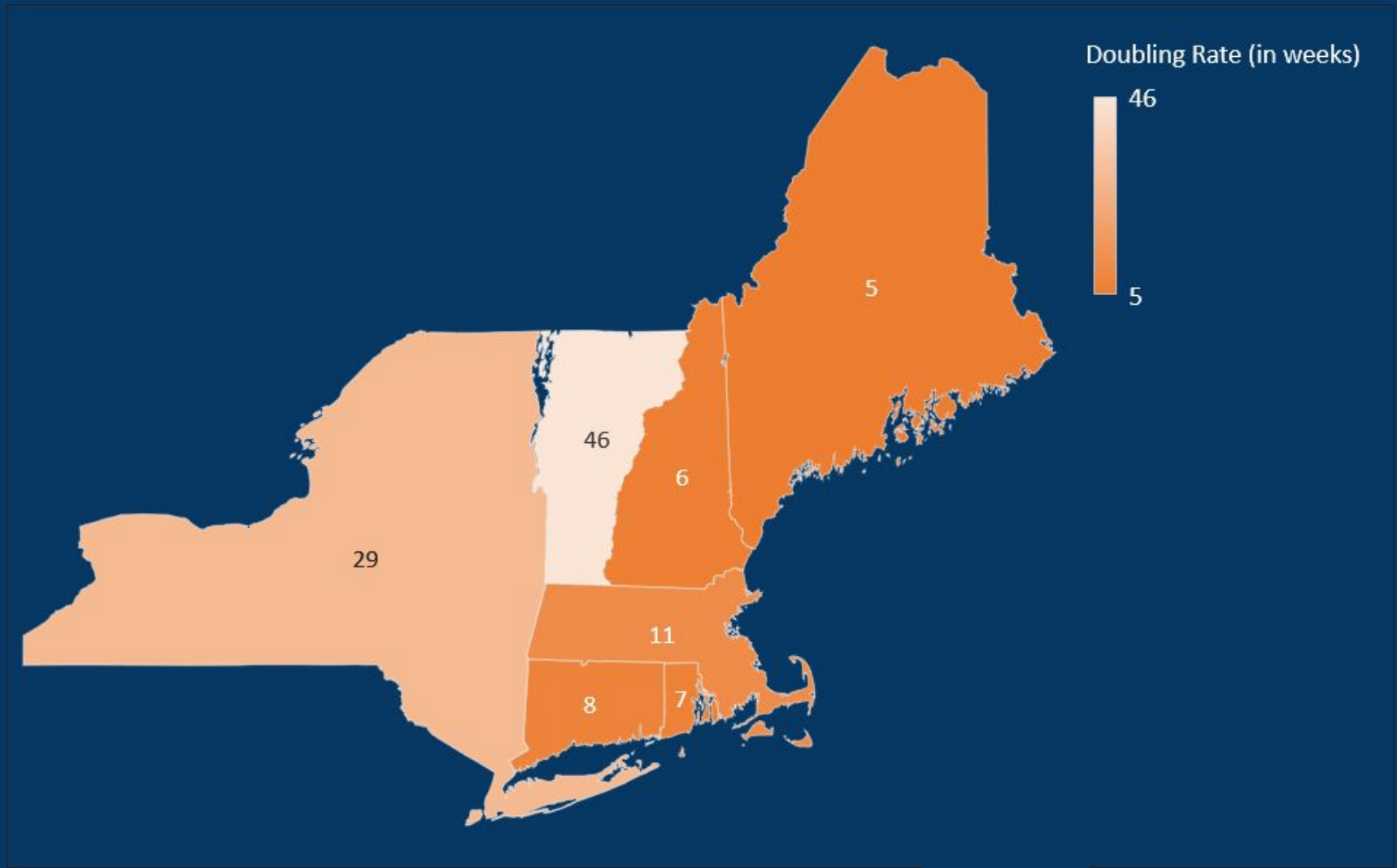
Positive Trend: Actual Results Are Better Than Forecasts



Time Until Confirmed Cases Double



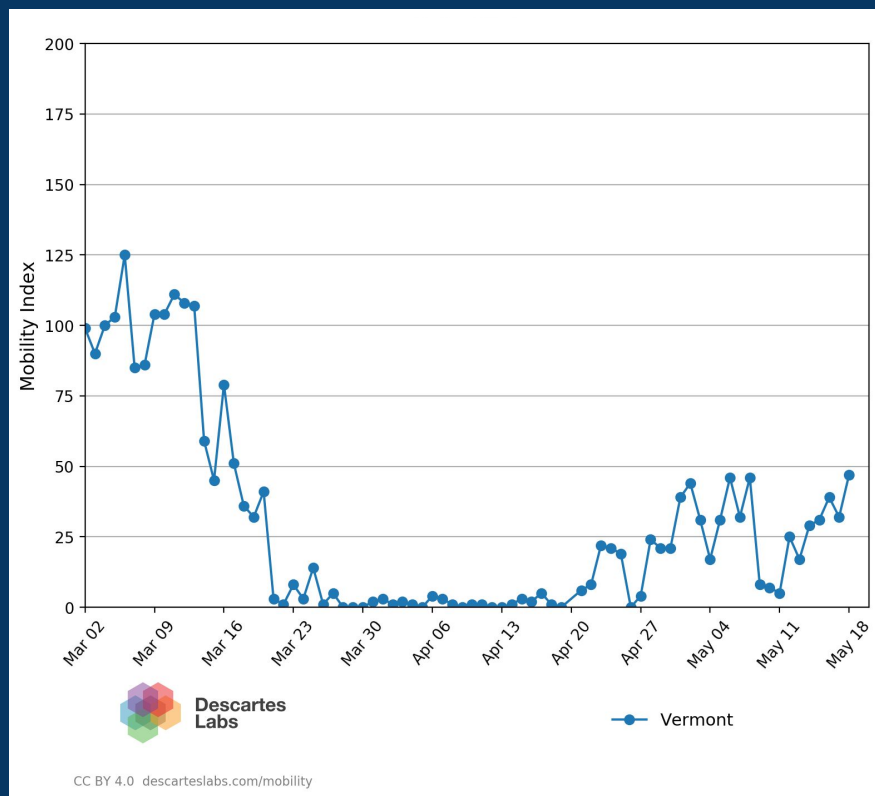
Vermont's Doubling Rate: 46 Weeks



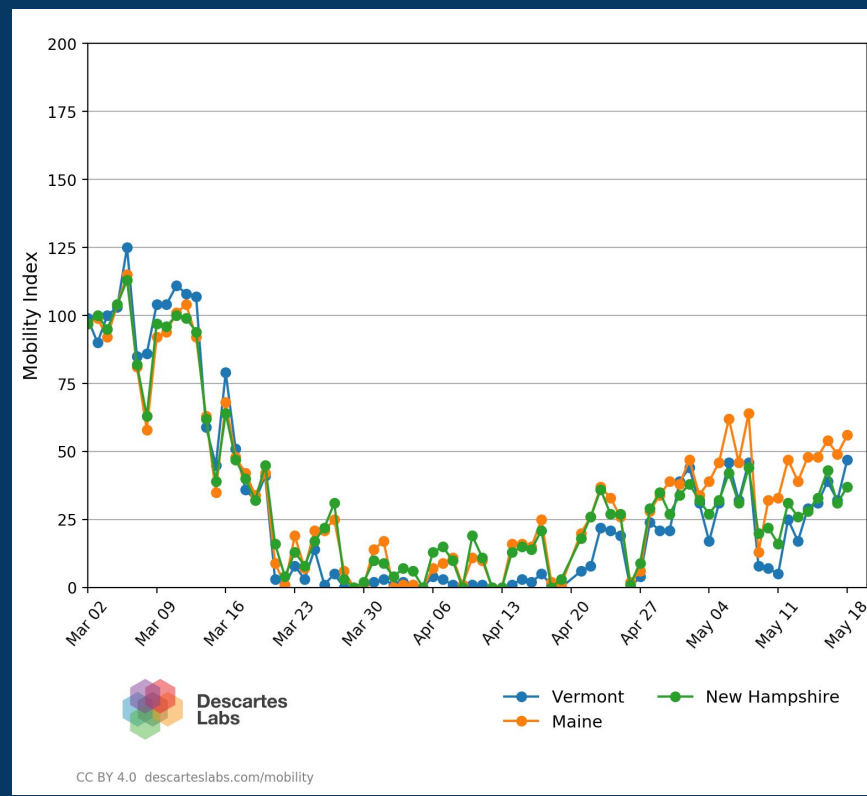
Mobility Data:

- Continued adherence to social distancing
- Increase in mobility with warming weather

Vermont



Northern New England



RESTART VERMONT

Metrics to Monitor

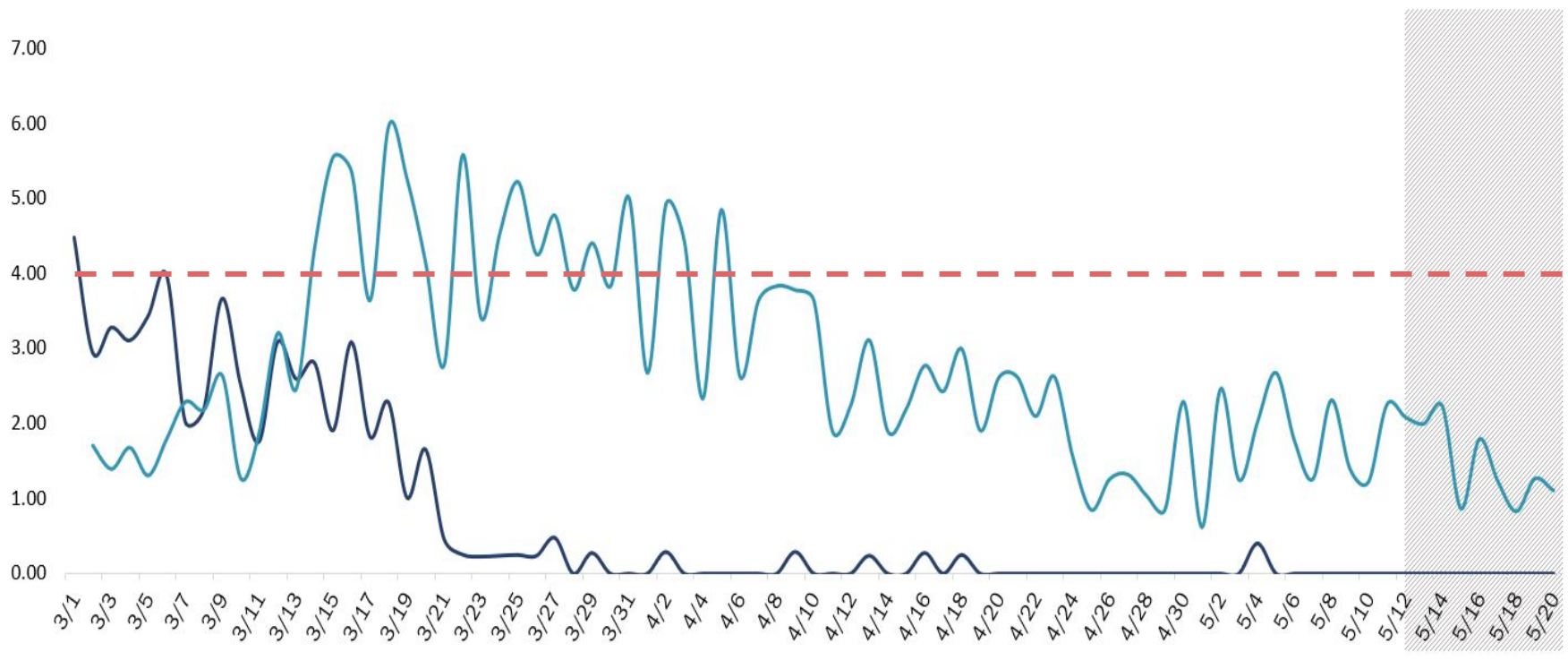
1. Syndromic Surveillance
2. Viral Growth & Reproductive Rates
3. Percentage of New Positive Tests
4. Hospital & Critical Care Bed Capacity

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

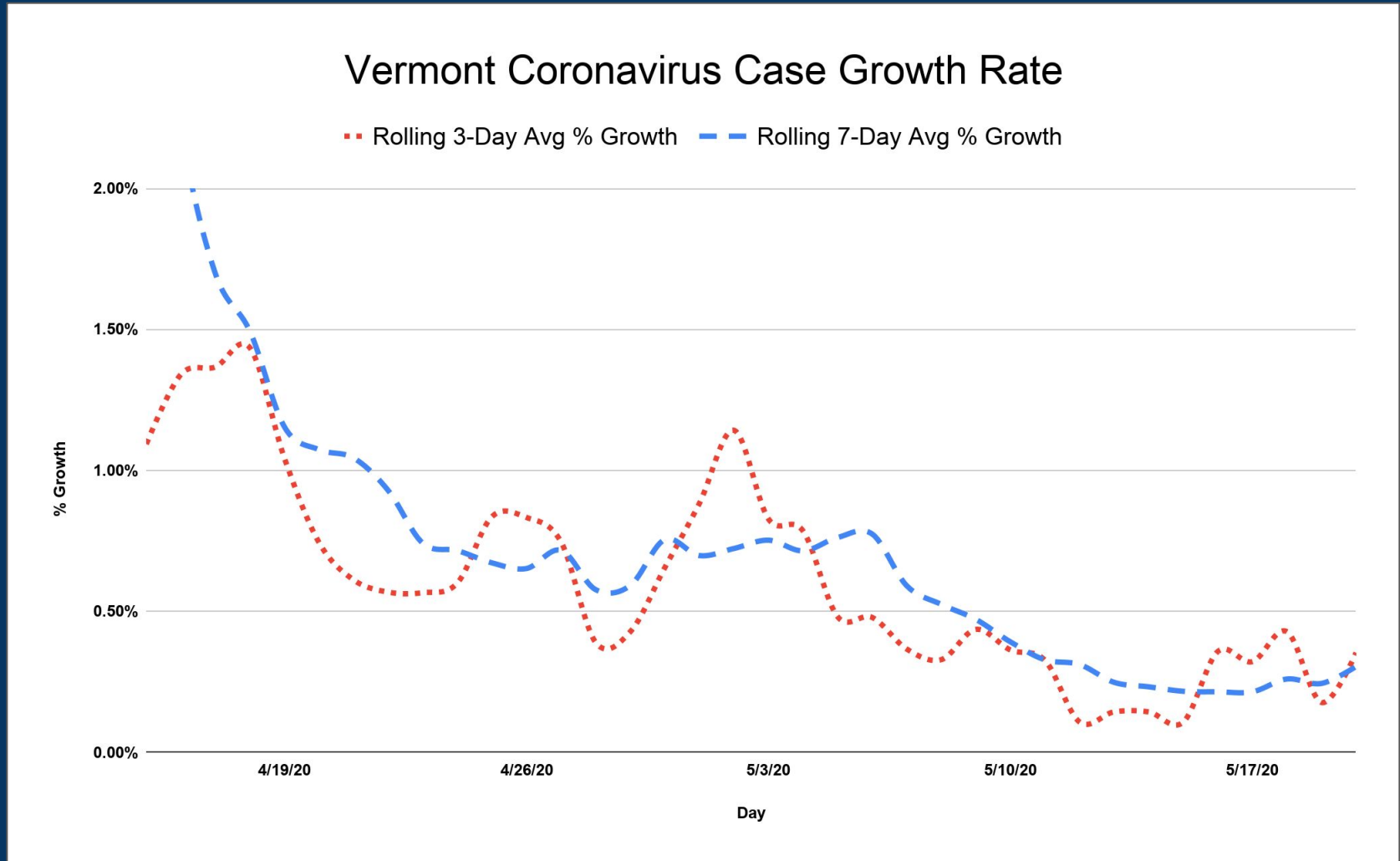
Percent of Emergent Care Visits for COVID-19 like illness and Influenza Diagnosis

Syndromic Surveillance from 13 of 14 Vermont Hospitals and 2 Urgent Care Centers



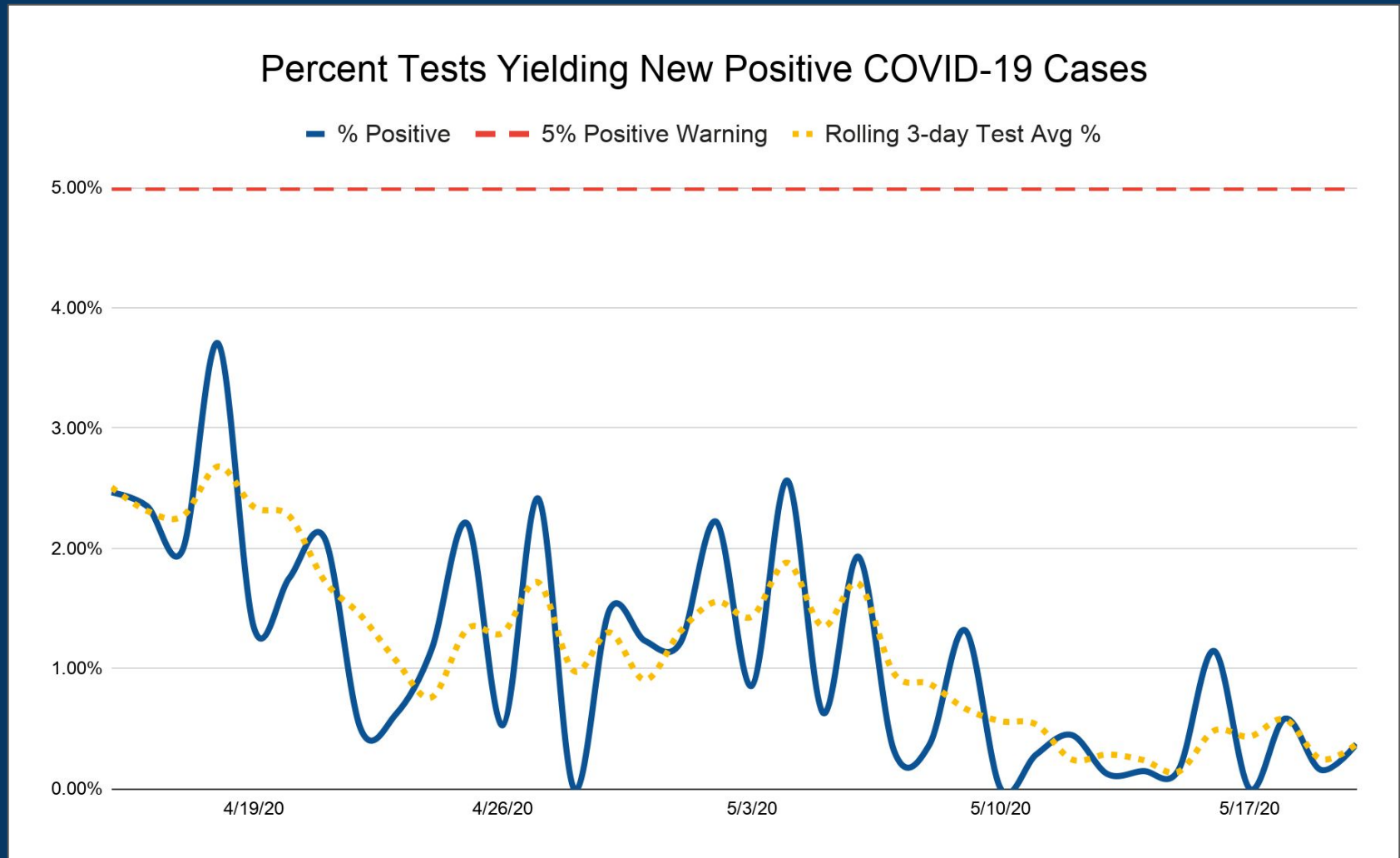
Data Point 2: Viral Growth and Reproductive Rates

- **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% of open ICU beds



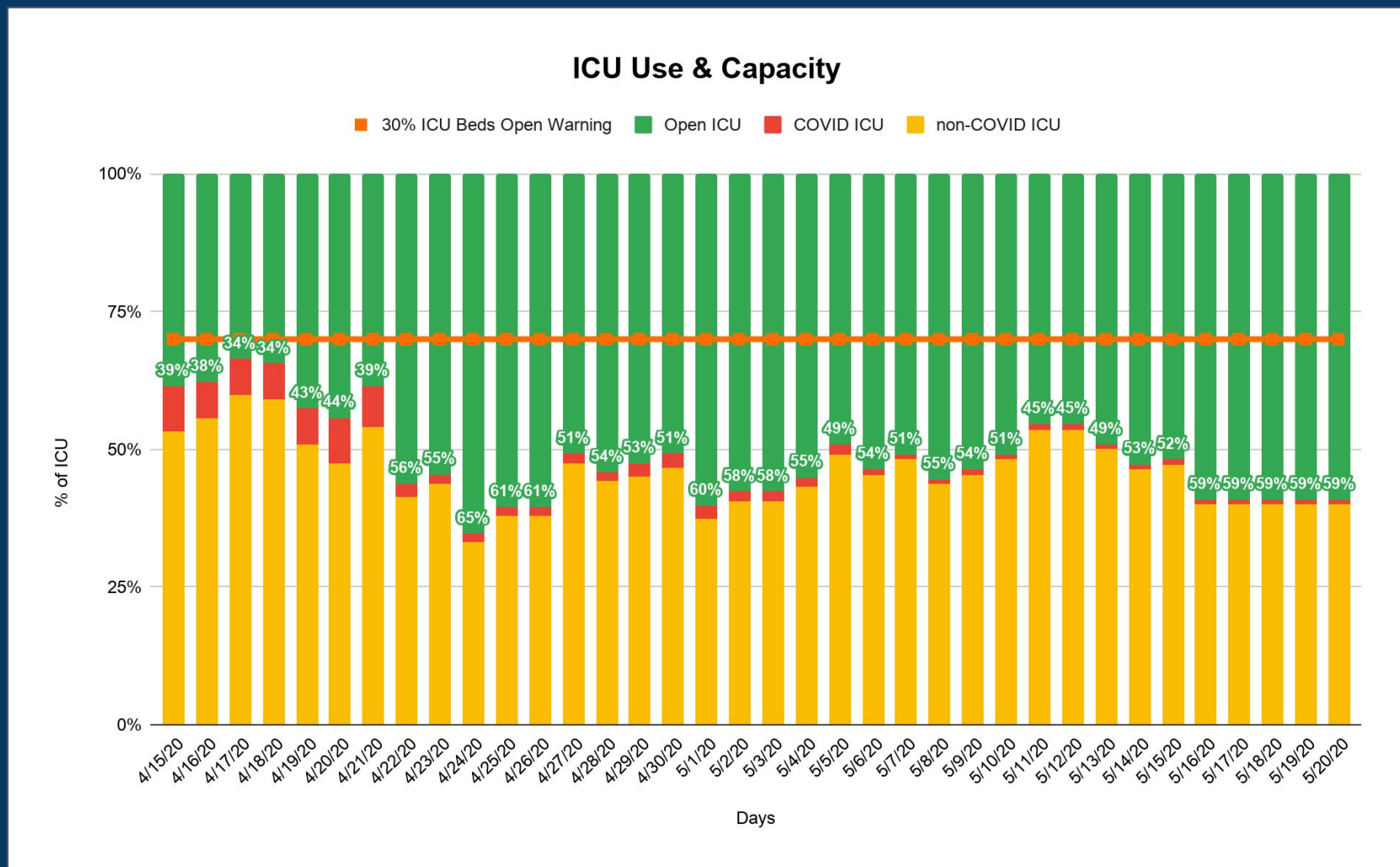
Data Point 3: Percentage of New Positive Tests

- **Summary:** Percent of tests resulting in a new positive case
- **Warning Flags:** New positives represent >5% of daily results

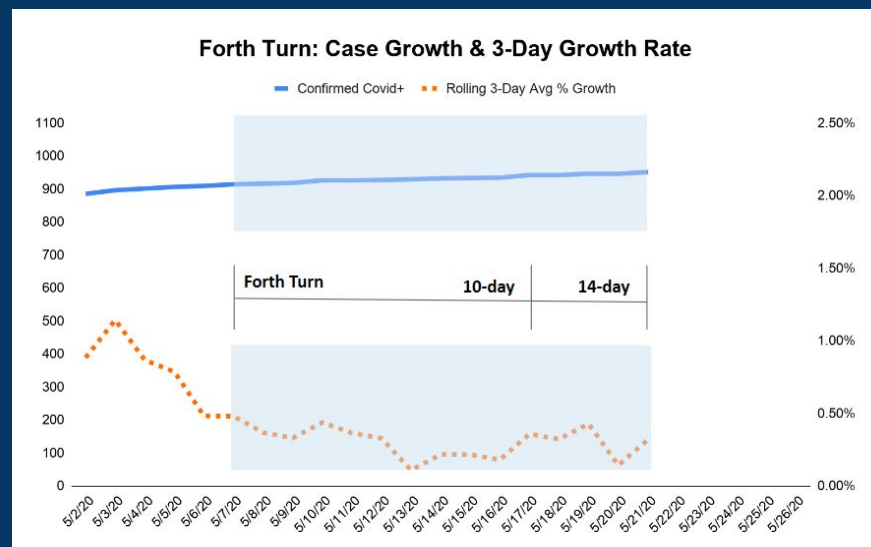
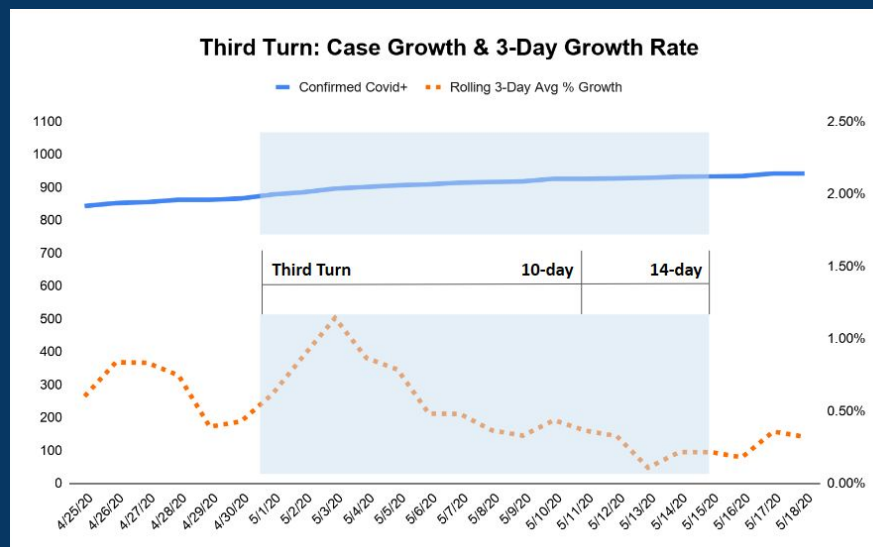
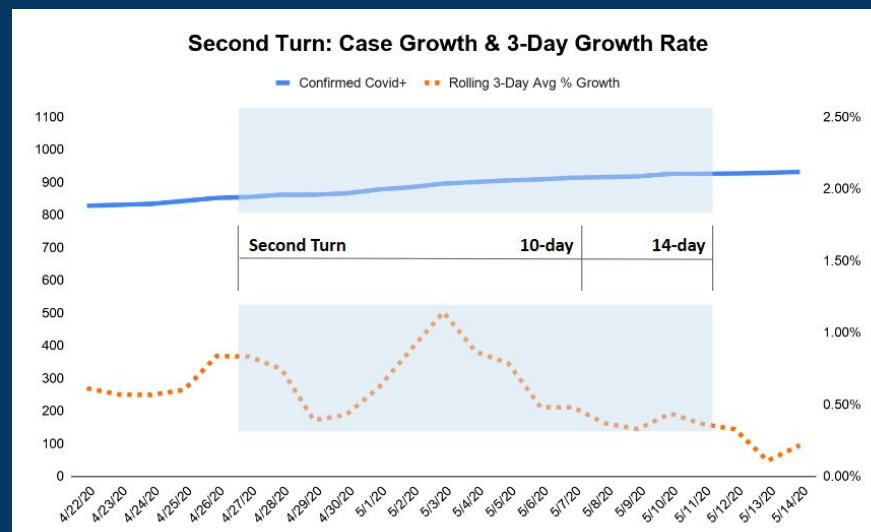
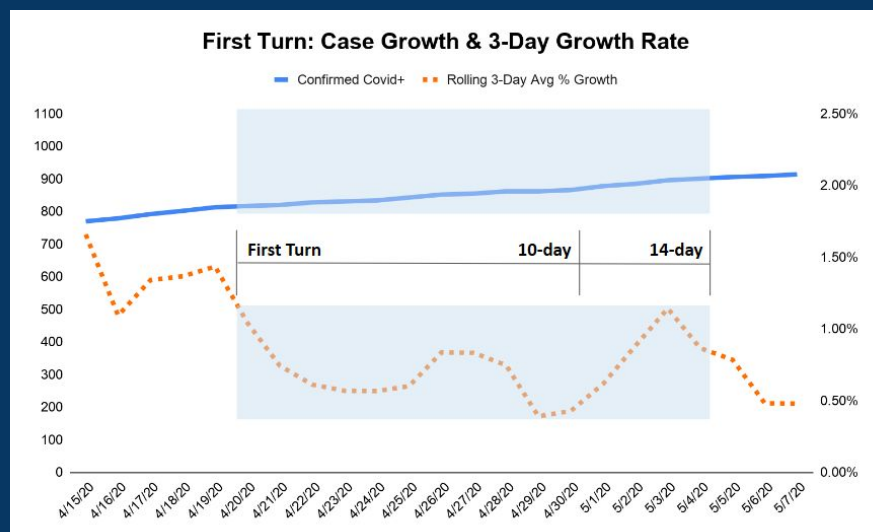


Data Point 4: Hospital & Critical Care Beds

- **Summary:** Number of occupied and unoccupied medical surgical and ICU beds
- **Warning Flags:** Reduction in ICU open beds to less than 30%

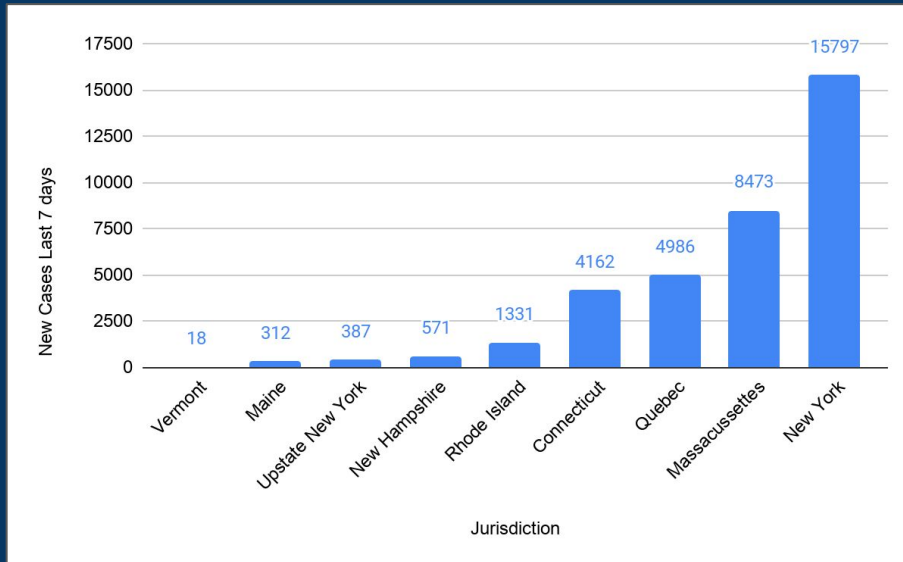


Restart Vermont: First Four Turns of the Spigot

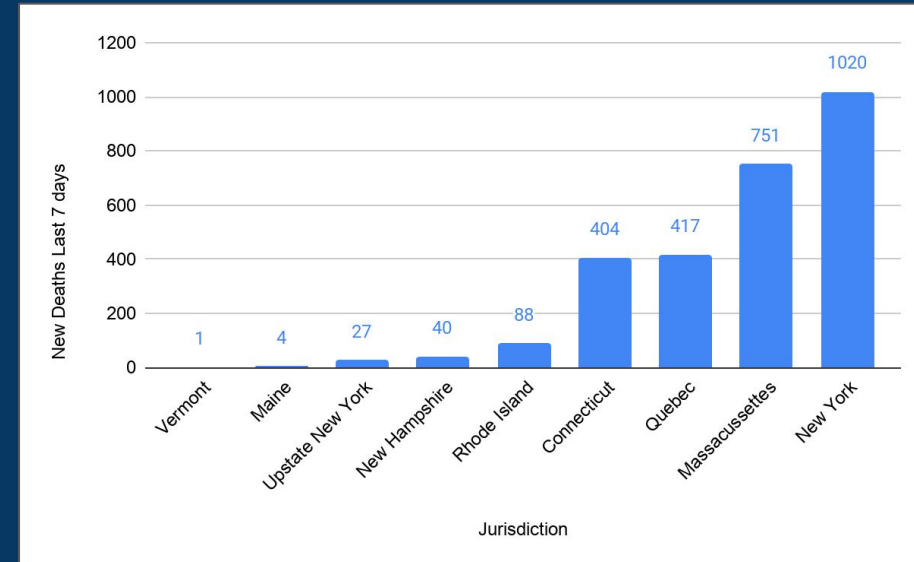


Regional Monitoring: Previous 7-Day Experience

Positive Cases Prior 7-Days (May 13-20)

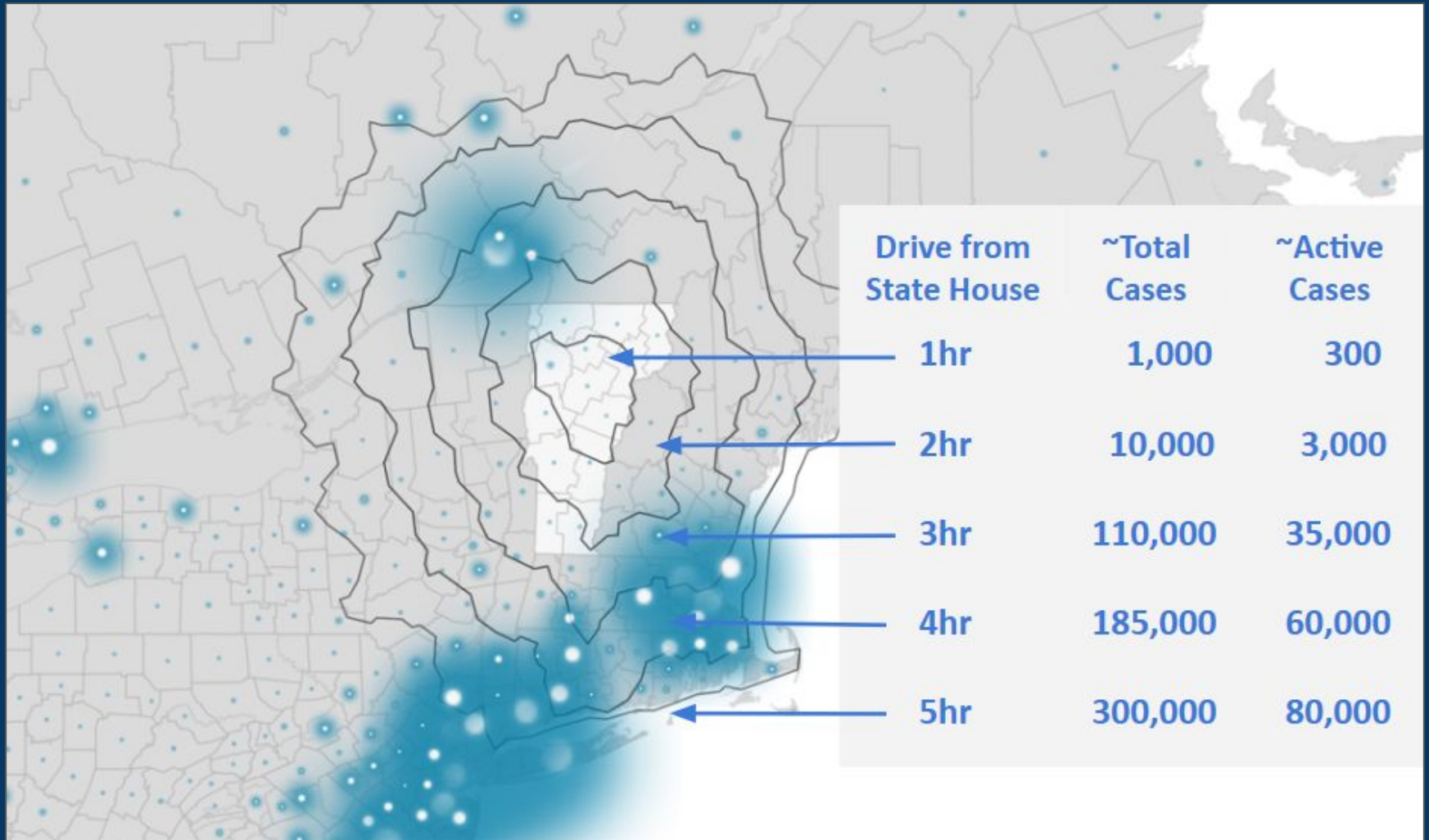


Deaths Prior 7-Days (May 13-20)



Source: Johns Hopkins University & USA FACTS

Regional Monitoring: Drive Time from the State House



Regional Monitoring: New COVID-19 Cases (May 13 - 20)

