UNIVERSITY of VIRGINIA
BIOCOMPLEXITY INSTITUTE

UVA COVID-19 MODEL WEEKLY UPDATE

VDH VIRGINIA DEPARTMENT OF HEALTH

December 11, 2020

KEY TAKEAWAYS

- The Thanksgiving holiday likely caused a short-term lag in testing and case reporting, which may be masking some infections.
- This weeks projections were heavily influenced by this lag. The UVA team suggests last week's projections may be more useful, particularly the "less control" scenario.
- Cases are surging nationally.
  - 34 states are in surge trajectories
  - Including most mid-Atlantic states.
- Even with the Thanksgiving data lag, cases are surging in 17 of Virginia's 35 health district.
- Due to surges and data lag UVA and RAND suggest using:
  - 3-day rather than 7-day averages to identify trends
  - Measures based on report or confirmation date over date of onset.

338,000

Total Cases Expected in 2021

32,000

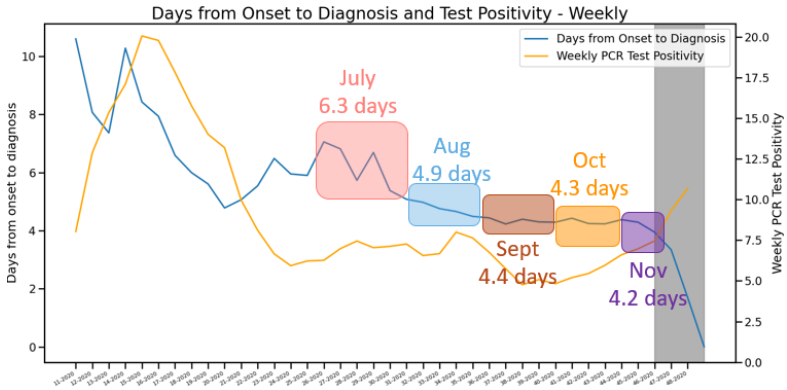
Expected Peak Weekly Cases
Week Ending Feb 7, 2021

KEY FIGURES

Reproduction Rate
(Based on Confirmation Date)

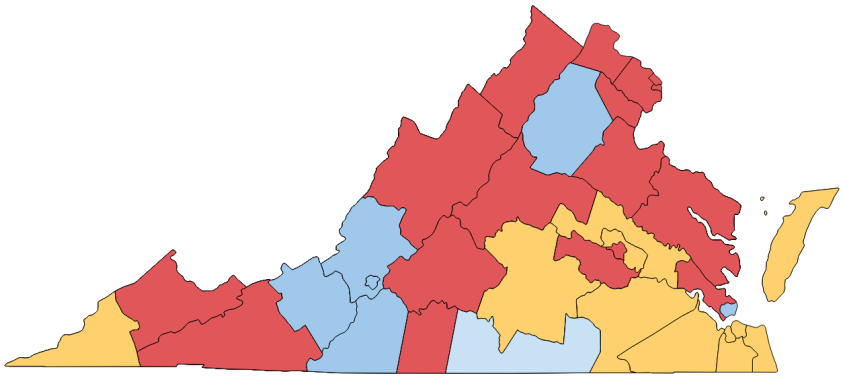
Region	R_e Dec 7	Weekly Change
State-wide	**1.130**	**0.010**
Central	1.283	0.242
Eastern	1.073	-0.032
Far SW	1.424	0.349
Near SW	0.987	0.029
Northern	1.034	-0.232
Northwest	1.309	0.190

Case Detection



Growth Trajectories: 17 Health Districts in Surge

Status	# Districts (prev week)
Declining	6 (2)
Plateau	1 (3)
Slow Growth	11 (9)
In Surge	17 (21)



VIRGINIA'S HEALTH IS IN OUR HANDS. Do your part, stop the spread.

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THE MODEL

The UVA COVID-19 Model and the weekly results are provided by the UVA Biocomplexity Institute, which has over 20 years of experience crafting and analyzing infectious disease models. It is a (S)usceptible, (E)xposed, (I)nfected, (R)ecovered epidemiologic model designed to evaluate policy options and provide projections of future cases based on the current course of the pandemic.

COVID-19 is a novel virus causing an unprecedented global pandemic and response. The model improves as we learn more about it.

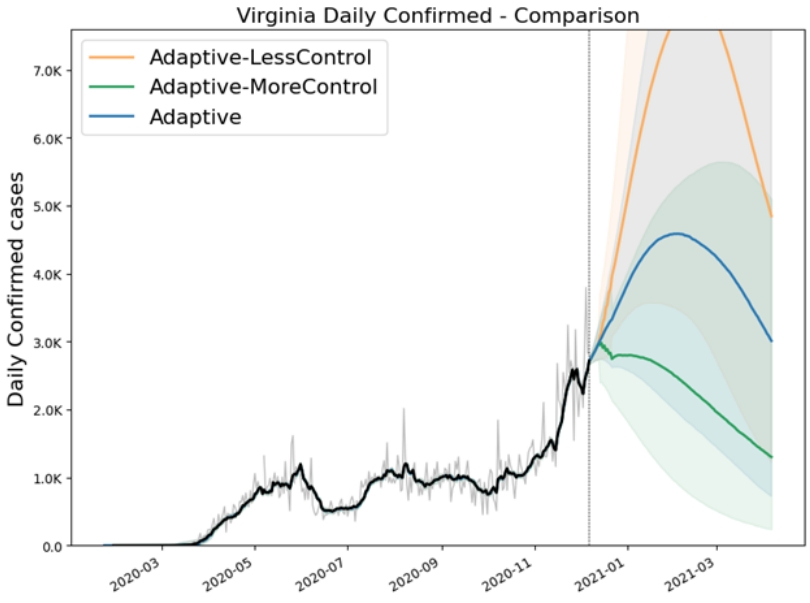
THE PROJECTIONS

The UVA team continues to improve the model weekly. The UVA model now uses an "adaptive fitting" methodology, where the model precisely traces past and current trends and uses that information to predict future cases. These new projections are based on recent trends the model learns through its precise fitting of each individual county's cases. The new model also includes two "what-if" scenarios to forecast how case growth may respond to seasonal effects, such as changing weather patterns and holiday travel. These "what-if" scenarios are:

Less control of seasonal effects: 15% increase in transmission starting December 10, 2020
More control of seasonal effects: 15% decrease in transmission starting December 10, 2020

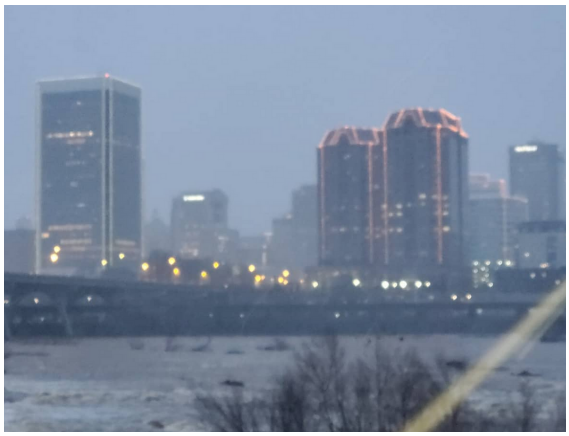
MODEL RESULTS

With the adaptive modeling approach, the current course predicts that confirmed cases continue to increase through model projection period **peaking at over 32,000 weekly cases on February 7.** However, this week's projections were likely influenced by the drop in testing and lag in data entry over Thanksgiving. We expect case data to improve, and case counts to increase, by next week. In the interim, last week's projection with cases peaking at over 47,000 likely provides better guidance. However, if Thanksgiving creates a surge in cases, the peak may be significantly higher. Yesterday, Governor Northam announced new mitigation measures to slow COVID-19 spread, complementing the guidance in the Forward Virginia plan. Virginia's health is in our hands. Do your part to stop the spread.



DECEMBER RAIN

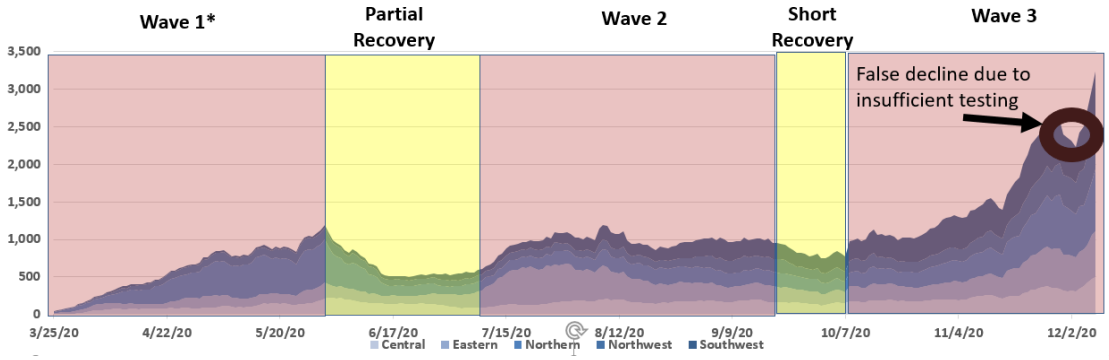
Over Thanksgiving, fewer people were tested for COVID-19. At the same time, surges in cases and the holiday created lags in data entry. However, COVID-19 did not stop spreading. Like all models, the UVA COVID-19 model depends on data, with more and better data providing more accurate and useful projections. This week's model projections were likely influenced by the data issues that occurred over Thanksgiving. We expect these issues to continue throughout December, especially during Christmas and New Year celebrations. While the COVID-19 data may be a bit hazy throughout December, we will still have a clear picture of the status of COVID-19's spread.



Richmond Virginia appears hazy through the wintery mix that occurred on the morning of December 7th, 2020. Fortunately, the Federal Reserve, BB&T Bank, and other private buildings are trimmed in lights throughout December, providing a clear view of the skyline.

Thanksgiving & COVID-19 Data

Our partners at RAND corporation closely monitor Virginia's data to identify long-term trends and short-term aberrations. Over the Thanksgiving holidays, new daily cases declined sharply. However testing also declined over 33 percent, but rebounded quickly after the holidays ended. Similarly, test positivity rates jumped and then declined over the same period. While the real number of new infections over Thanksgiving is unclear, the testing data reveals that the decline is likely a data artifact, and that COVID-19 continued to spread over the holiday.



The false decline in Virginia's COVID-19 cases over Thanksgiving is clear in this visualization from RAND Corporation. New case growth quickly returned to trend after the holidays.

The Impact on the UVA COVID-19 Model's Projections

This week, the UVA COVID-19 Model projected far fewer cases than in the previous week, including fewer cases overall and lower peaks. Like all models, the UVA COVID-19 model uses information about the past to forecast the future. How sensitive models should be to recent data compared to long term trends is always a matter of debate. During a fast-moving global pandemic, sensitivity to near term trends is warranted, even if this sensitivity occasionally creates unusual results. In this case, the data quality issues over Thanksgiving likely caused this week's projections to undershoot reality, just as the case data did.

Interpreting the Data and the Model Projections

The data and projections may be hazy, but it still offers insight into the course of COVID-19, providing the best guideposts available to plan for the future. Importantly, the Virginia Department of Health, along with state, federal, and private sector partners such as the Virginia Hospital and Health Care Association, collect and report on a wide variety of indicators. When one gets hazy, others can fill the gap much like the testing data discussed above. Public health officials are also in contact with health systems and providers on the ground, providing another check on the data. Taken together, the outline is clear. COVID-19 is surging nationally and in Virginia. We all must take additional steps to slow the spread. Virginia's health is in our hands.