UNIVERSITY of VIRGINIA
BIOCOMPLEXITY INSTITUTE

UVA COVID-19 MODEL WEEKLY UPDATE

VDH VIRGINIA DEPARTMENT OF HEALTH

December 18, 2020

KEY TAKEAWAYS

- The post-Thanksgiving surge led to a substantial increase in projections
  - The projected peak is 98,000 new confirmed cases during the week ending Feb. 7
  - This is 13 times higher than the summer peak of 7,550 for the week ending Aug 9.
- Preliminary vaccine impacts have been incorporated into the model
  - The impacts are limited during the projection period and dwarfed by the impact of other mitigation strategies
- The surge in cases is affecting all regions in Virginia, all neighboring states, and the District of Columbia
- Weekly case rates in the Midwest are beginning to decline from the extremes seen just a few weeks ago

402,731

Total Cases Expected in 2021

98,000

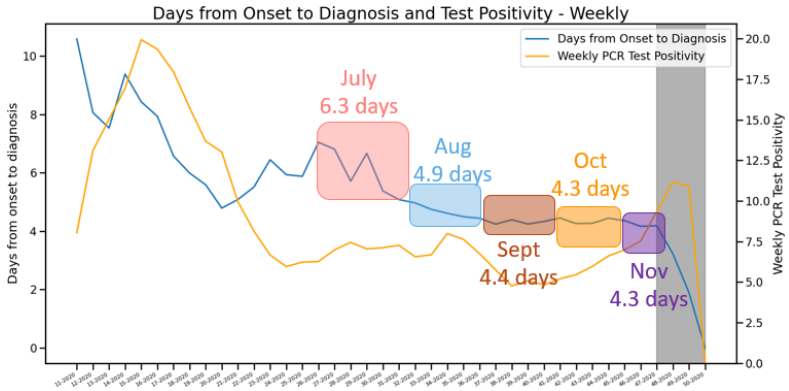
Expected Peak Weekly Cases
Week Ending Feb 7, 2021

KEY FIGURES

Reproduction Rate
(Based on Confirmation Date)

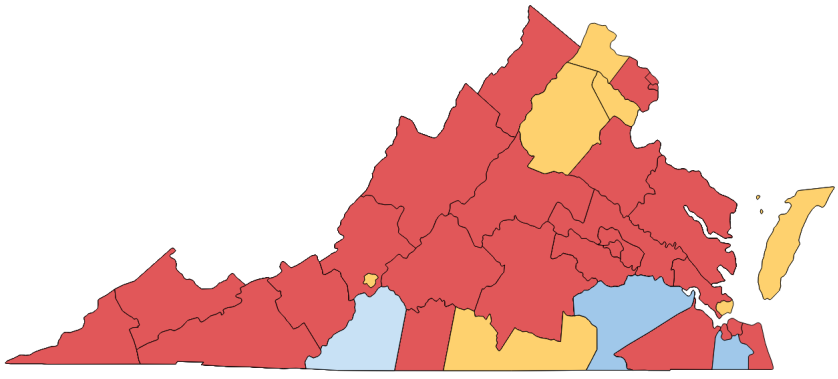
Region	R_e Dec 14	Weekly Change
State-wide	**1.394**	**0.264**
Central	1.131	-0.151
Eastern	1.387	0.315
Far SW	1.202	-0.221
Near SW	1.386	0.399
Northern	1.256	0.222
Northwest	1.222	-0.087

Case Detection



Growth Trajectories: 25 Health Districts in Surge

Status	# Districts (prev week)
Declining	2 (6)
Plateau	1 (1)
Slow Growth	7 (11)
In Surge	25 (17)



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.

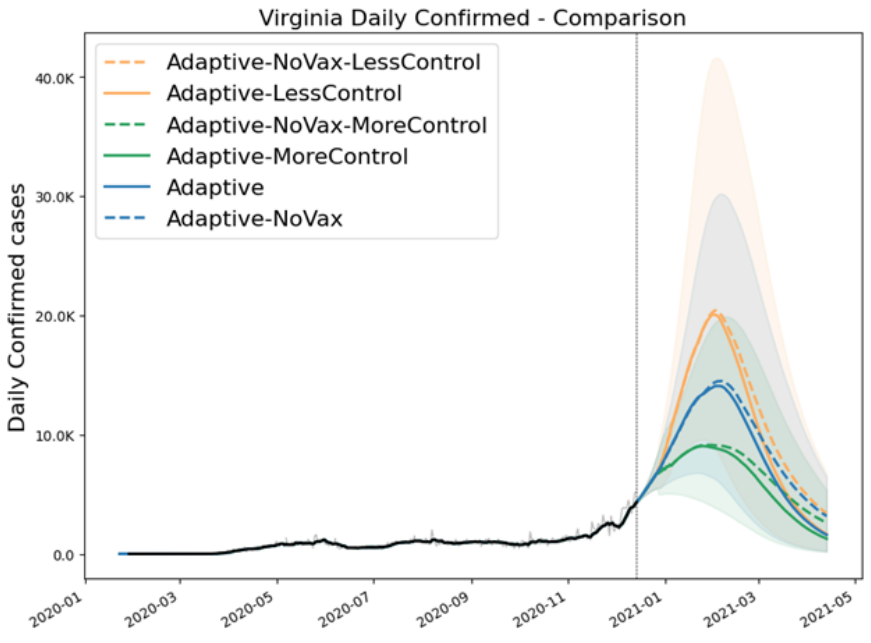
THE PROJECTIONS

The UVA team continues to improve the model weekly. The UVA model uses an "adaptive fitting" methodology, where the model precisely traces past and current trends and uses that information to predict future cases at the local level. This week, the model incorporates preliminary projections on the impact of vaccines. Projections incorporating vaccines will improve over time. Several scenarios are included, including counterfactual "no vaccine" scenarios and scenarios showing either more or less non-vaccine control of transmission, including behavioral and policy changes.

Less control of seasonal effects: 15% increase in transmission starting December 24, 2020
More control of seasonal effects: 15% decrease in transmission starting December 24, 2020

MODEL RESULTS

This week's model incorporated preliminary information on the effect of vaccines, along with several counterfactual scenarios. Even with vaccines, the adaptive model shows **week cases peaking at over 98,000 on February 7.** This is three times higher than last week's projection and demonstrates the impact that Thanksgiving gatherings had on case growth. Over the course of the model projections, behavioral and community mitigation strategies have a far higher impact on case numbers than the vaccine. Under the less control scenario, new weekly cases peak at 138,000. However, with more control, cases peak at 63,000 per week in late January. Last week, 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.



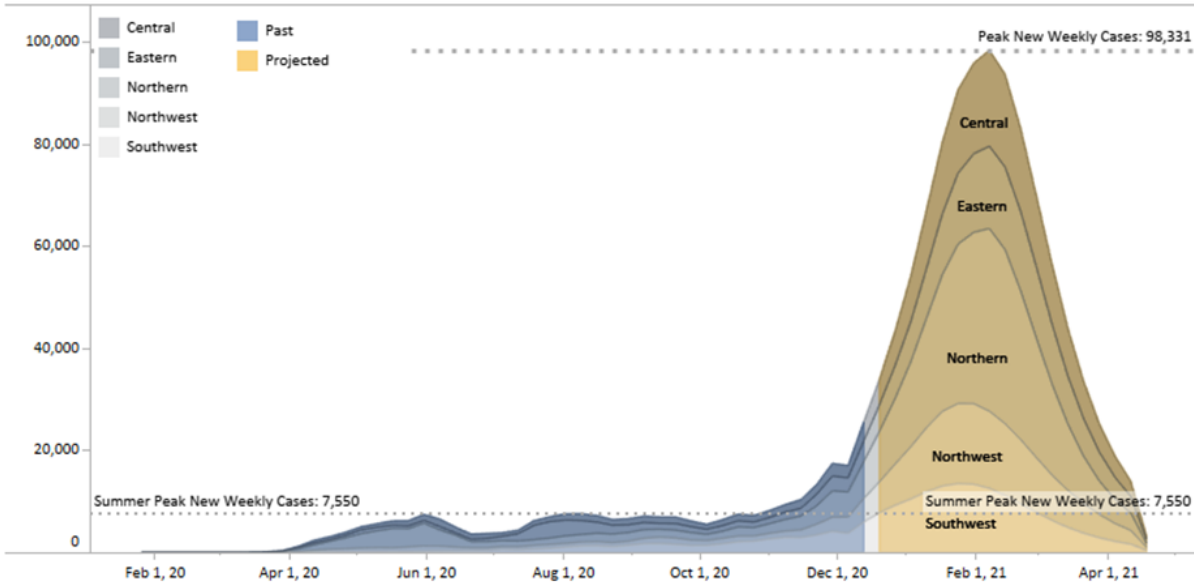
The solid lines show scenarios with the potential impact of the vaccine included, while the dashed lines show the same scenarios without. Regardless of the scenario, the vaccine will have only a limited impact with the projection period. Behavioral and community mitigation strategies will have a much larger impact, as shown in the "less control" and "more control" scenarios.

WINTER IS HERE

The winter equinox occurs in three days on Monday, December 21st marking the beginning of winter and the longest night of the year. For the past several months public health officials have been preparing the public for the risks winter posed for the spread of COVID-19. Cold weather, time indoors, and pandemic fatigue, spurred by holiday travel and gatherings, increase the risk of transmission. Meanwhile, the impact of new vaccines, while promising, will not be felt for several months. These risks have now been realized. Early data indicates that the post-Thanksgiving surge is large. If compounded with surges accompanying Christmas, Hanukkah and other winter holidays, it could be a long, cold winter.

The post-Thanksgiving Surge

Over the summer, new confirmed cases per week peaked at just over 7,500 a few times in May, July and August. If adequate testing was available in May, as it has been since about July, we likely would have identified many more cases. However, cases in July and August are likely comparable to today's figures. The current surge in Virginia began early in the fall, and cases exceeded summer peaks by mid November. The UVA model projects almost 34,000 new confirmed cases for the week ending this Sunday, the last day of fall. If cases continue to grow at this rate and in this manner, we can expect over 98,000 per week in early February. This is 13 times higher than the peaks seen over the summer.



If new confirmed cases continue to surge at this rate and in this manner, the UVA COVID-19 model projects weekly confirmed cases will peak at over 98,000 during the week ending Feb. 7. This is 13 times higher than the peaks seen over the summer.

The Impact of the Vaccine

The news about the vaccine is promising. So far, multiple candidates have shown strong efficacy with only mild side effects. However, manufacturing, deploying and administering hundreds of millions vaccine doses is a massive undertaking. The first doses will go to health care workers and vulnerable citizens in long-term care facilities, but reaching even these will take some time. As the chart at the bottom of the previous page shows, the vaccine will have limited impact until late spring or summer. In the meantime, cases, hospitalizations, and deaths will continue to rise. We will need to continue to take steps to flatten the curve and see us through to spring. The good news is the effect of behavioral and community mitigation strategies, which will have a much larger impact on transmission for the foreseeable future, are enhanced as the vaccine rolls out. The end of the pandemic is in sight, and we can bring it to a close faster and with less hardship by following basic prevention measures, following the guidelines in the Forward Virginia plan, and other pursuing other mitigation strategies. Virginia's health is in our hands. Do your part to stop the spread.