UNIVERSITY of VIRGINIA
BIOCOMPLEXITY INSTITUTE

VDH VIRGINIA DEPARTMENT OF HEALTH

January 15, 2020

KEY TAKEAWAYS

- Projections include preliminary estimates of the affect of vaccine deployment. The impact is limited early in 2021.
- New scenarios paint very different pictures of the course of the pandemic.
    - A slow vaccine rollout, accompanied by pandemic fatigue, could see new cases increasing into April.
    - Current projections show high weekly peaks in mid-February.
- Test positivity is above 15%, indicating that some cases are likely being missed.

50,232

Expected Peak Weekly Cases Week Ending Feb 14, 2021

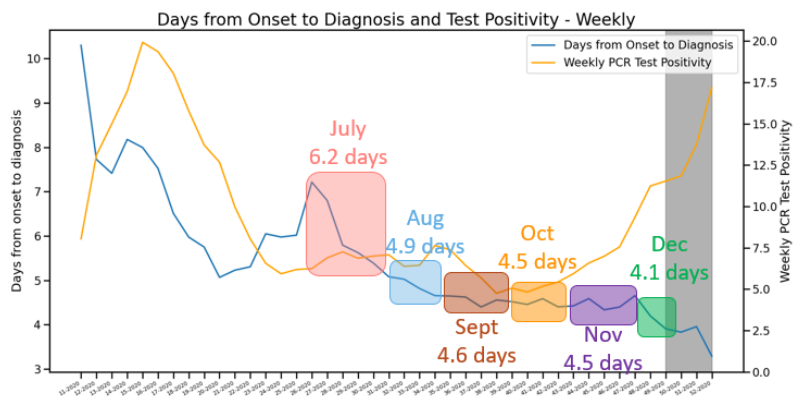............................

Total Cases Expected in:

Dec: 94,000
Jan: 187,000
Feb: 196,000
Mar: 144,000

KEY FIGURES

Reproduction Rate
**(Based on Confirmation Date)**

Region	R_e Jan 11	Weekly Change
State-wide	**1.138**	**-0.021**
Central	1.164	-0.136
Eastern	1.282	0.096
Far SW	0.960	-0.177
Near SW	1.291	0.167
Northern	1.015	-0.069
Northwest	1.086	-0.100

Case Detection

Days from Onset to Diagnosis and Test Positivity - Weekly

July 6.2 days
Aug 4.9 days
Sept 4.6 days
Oct 4.5 days
Nov 4.5 days
Dec 4.1 days

Growth Trajectories: 17 Health Districts in Surge

Status	# Districts (prev week)
Declining	3 (10)
Plateau	1 (3)
Slow Growth	14 (13)
In Surge	17 (9)

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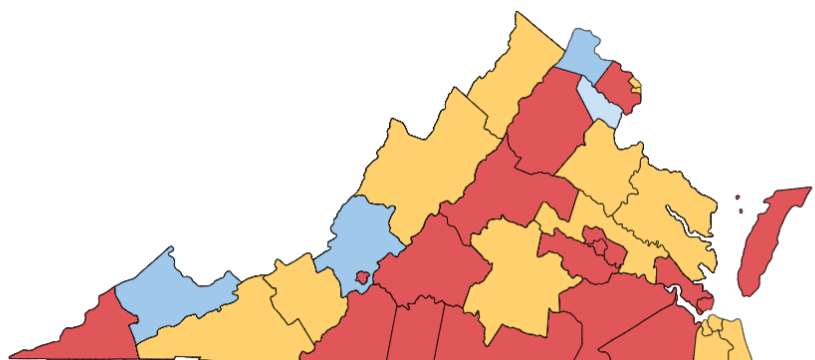
THE MODEL

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. The new model also includes two "what-if" or planning scenarios. The "Best Past Control" scenario projects what may occur if localities match the lowest rates of transmission seen earlier in the summer. This scenario also includes an optimistic vaccine rollout scenario, meeting public targets. The "Fatigued Control" scenario does the opposite, projecting the highest transmission rates forward and using a pessimistic vaccine rollout scenario.

MODEL RESULTS

This week's model incorporated preliminary information on the effect of vaccines, along with several counterfactual scenarios. The adaptive model shows weekly cases peaking at over 50,000 during the week ending February 14. 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 Fatigued Control scenario, new weekly cases peak at 75,000, with cases rising through early April. However, with more control, cases peak at 48,000 per week in early February. On December 10, 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.**
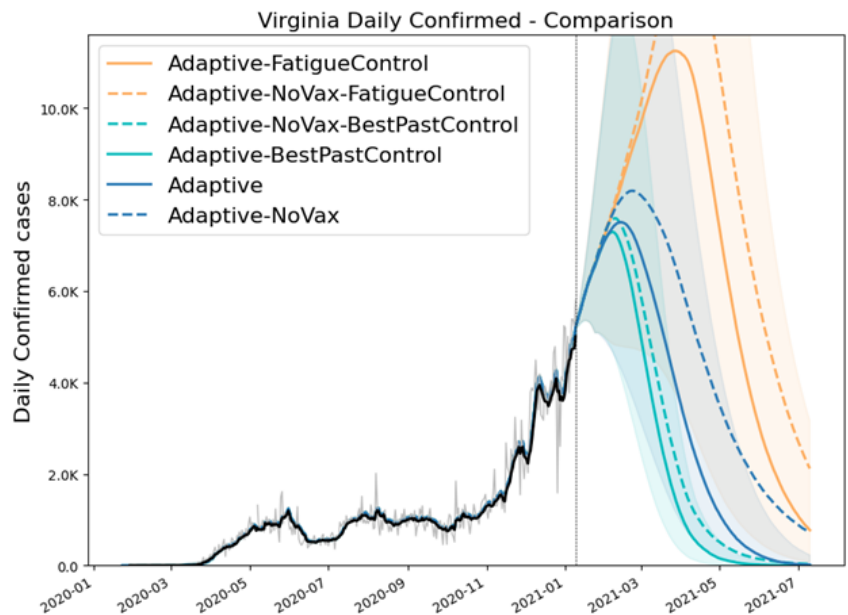
The solid lines show scenarios with the potential impact of the vaccine included, while the dashed lines show the same scenarios without. Regardless of the scenario, the vaccine will have only a limited impact with the projection period. Behavioral and community mitigation strategies will have a much larger impact, as shown in the "less control" and "more control" scenarios.

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

NEW PLANNING SCENARIOS

This week, in addition to its baseline scenario, the UVA modeling team produced two new scenarios. The Fatigue Control scenario examines a worst case scenario. In this scenario a slow vaccine rollout, coupled with relaxed prevention efforts, increases the risk of overwhelming hospitals while extending the worst impacts of the pandemic. With improved prevention efforts and an optimistic vaccine scenario, the Best Past Control scenario shows the opposite. Taken together, they show two very different potential timelines for the COVID-19 pandemic in Virginia.

## Seasonal Effects and Pandemic Fatigue

As discussed in earlier reports, winter weather tends to drive people inside at the same time people are travelling and gathering for the holidays. Both of these factors increase the risk of transmission. These seasonal factors seem to have take their toll. Virginia had 9,000 new cases per week. in the first week of November. This week, we are on track for 38,000 new cases. Pandemic fatigue, however, may pose a a longer-term threat. Despite experiencing almost 400,000 deaths in the US, COVID-19 can seem abstract to those not directly affected. Sustaining prevention efforts is challenging.

Vaccine Deployment

As of January 12, 773,825 vaccine does had been distributed in Virginia. According to Virginia Department of Health data, 23% of those had been administered as of that date. Data lags likely account for much of the gap, but logistical problems are also a concern. Both of these issues should be improve but the speed of the vaccine rollout is still uncertain. Most Americans plan to get the vaccine but some may choose not too. Both of these will affect the course and duration of the COVID-19 pandemic.

The Fatigued Control Scenario

The Fatigued Control scenario (right) assumes that, as pandemic fatigue sets in, each Virginia locality returns to the highest transmission rates it has experienced (excluding outliers). This is paired with a pessimistic vaccine rollout, where only about half of the planned vaccine distributions are administered due to logistical issues or vaccine hesitancy. In this scenario, new weekly cases peak at 75,000 in late March, and persist at these levels into April.

Scenario: Adaptive - Fatigued Control

Scenario: Adaptive - Best Past Control
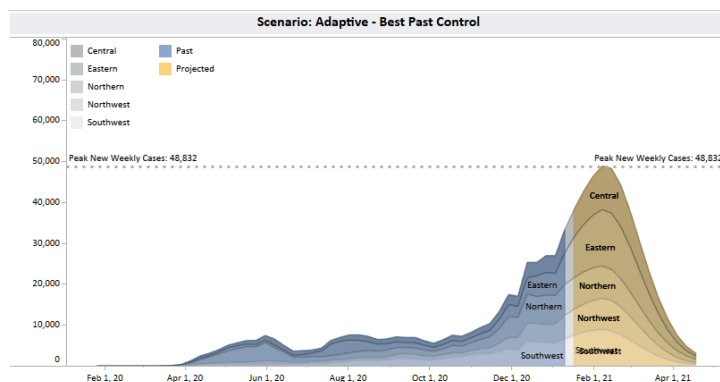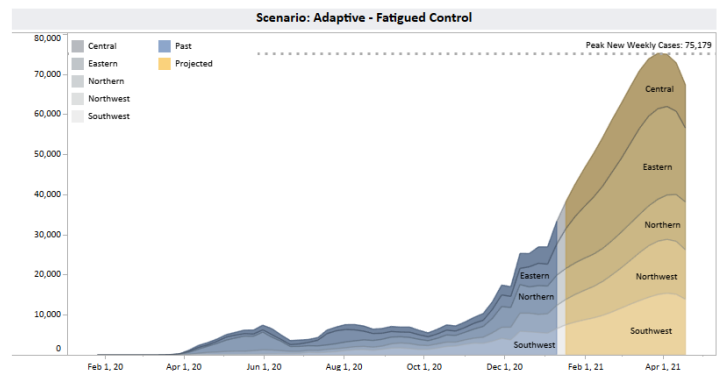
The Best Past Control Scenario

The Best Past Control scenario (left) does the opposite. It assumes that seasonal impacts diminish through the spring, and Virginians maintain or increase prevention efforts, returning to the lowest transmission rates in each locality. It also assumes that the vaccine rollout goes as planned, with nearly all delivered doses being administered in a timely fashion with limited vaccine refusal. In this scenario new weekly cases peak much earlier, in early February, at just under 50,000 new cases per week.

These two scenarios show just how much Virginia's health is in our hands. COVID-19 is likely to remain a part of our lives well into 2021. However, with good prevention efforts coupled with strong vaccine distribution and uptake, its impact may begin to diminish by spring. Without those, however, the impact of COVID-19 will increase into late spring our early fall. Do your part to stop the spread.