January 22, 2020

KEY TAKEAWAYS

- Data and model results have stabilized following the holidays. Test positivity remains high, however, making comparisons to earlier data difficult.
- A new scenario includes possible new variants.
  - Assumes 40% transmissibility increase
  - Gradual replacement with the new variant in the SEIR model over two months.
  - This scenario will be updated as new information becomes available.
- With New Variants, new weekly cases remain at 65K + for 10 weeks, from the week ending February 21 to April 25.

50,370

Expected Peak Weekly Cases
Week Ending Feb 14, 2021

Total Cases Expected in:

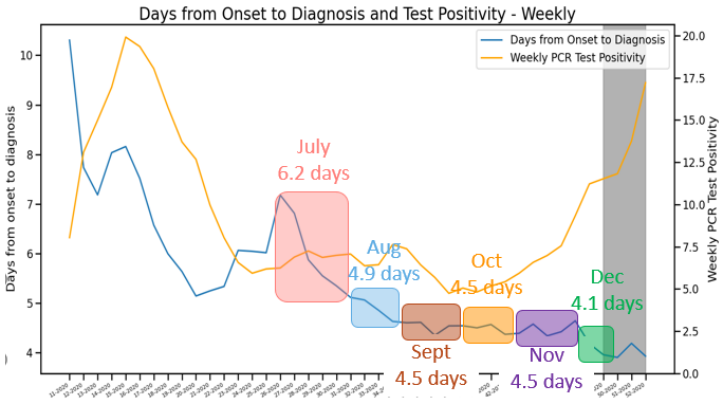
Dec: 94,000
Jan: 190,000
Feb: 197,000
Mar: 146,000

KEY FIGURES

Reproduction Rate
(Based on Confirmation Date)

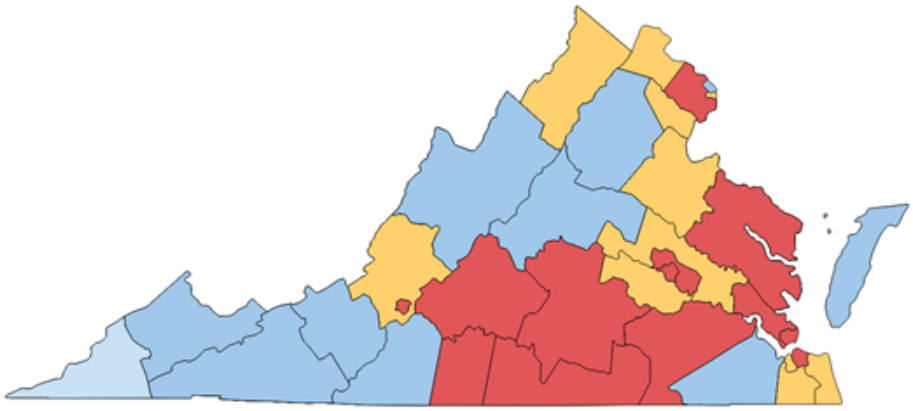
Region	R_e Jan 18	Weekly Change
State-wide	**1.149**	**0.011**
Central	1.218	0.053
Eastern	1.109	-0.173
Far SW	0.807	-0.154
Near SW	1.097	-0.195
Northern	1.344	0.329
Northwest	0.919	-0.166

Case Detection



Growth Trajectories: 13 Health Districts in Surge

Status	# Districts (prev week)
Declining	10 (3)
Plateau	1 (1)
Slow Growth	11 (14)
In Surge	13 (17)



UNIVERSITY of VIRGINIA
BIOCOMPLEXITY INSTITUTE

UVA COVID-19 MODEL WEEKLY UPDATE

VDH VIRGINIA DEPARTMENT OF HEALTH

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.

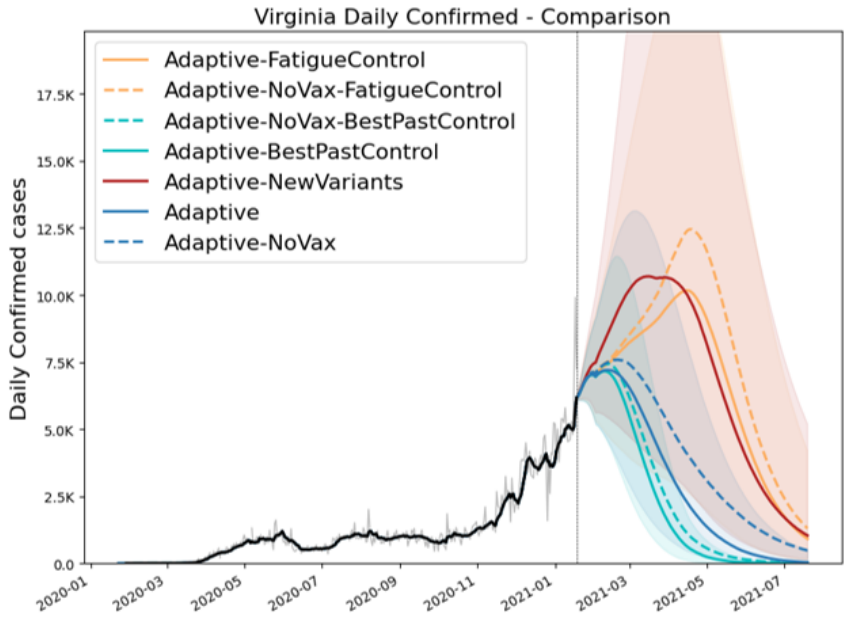
COVID-19 is a novel virus causing an unprecedented global pandemic and response. The model improves as we learn more about it.

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 model also includes three "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. The "New Variants" scenario projects the potential impact of new variants, including a 40% increase in transmission, with new variants gradually becoming dominant in two months.

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 71,000, with cases rising through mid April. However, with more control, cases peak at about 50,000 per week in early February. If new variants become dominant, which is expected in the US by March, new weekly cases could sustain a peak of over 65,000 new weekly cases for 10 weeks, from late February to late April. **Do your part to stop the spread. Continue to practice good prevention and get vaccinated when eligible.**



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.

PROJECTING NEW VARIANTS

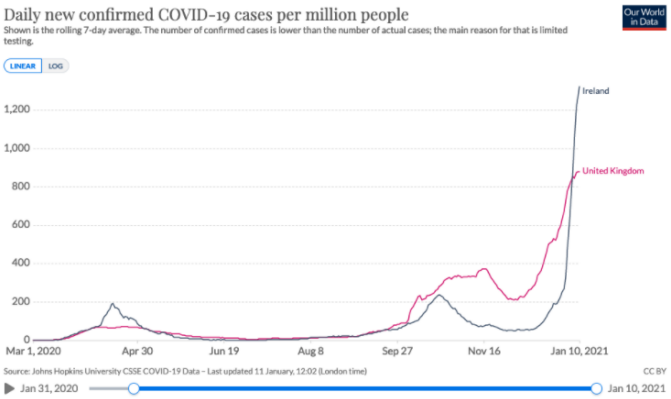
Like all biological entities viruses evolve., creating new variants with different characteristics. Most variants are harmless but some may have characteristics that increase risk, such as increasing transmission rates or virility, making testing harder, or eluding existing antibodies or vaccines. As the number of cases increases, so do opportunities for the virus to evolve. In December, researchers in the United Kingdom identified a Variant of Concern (VoC) for COVID-19. Since then, several others have been identified, including VoCs in South Africa, Brazil and California.

What Do We Know About These Variants?

There is no evidence that people infected with these VoCs are more likely to get sick or die compared to existing variants, or that they elude vaccines or test. Though not definitive, there is evidence that these VoCs increase transmissibility. For a virus like COVID-19, increased transmissibility is very concerning. More people are likely to be infected, resulting in a corresponding increase in illness and deaths. Additionally, VoCs spread more quickly, increasing pressure on hospitals, healthcare workers and funeral homes already strained by COVID-19.

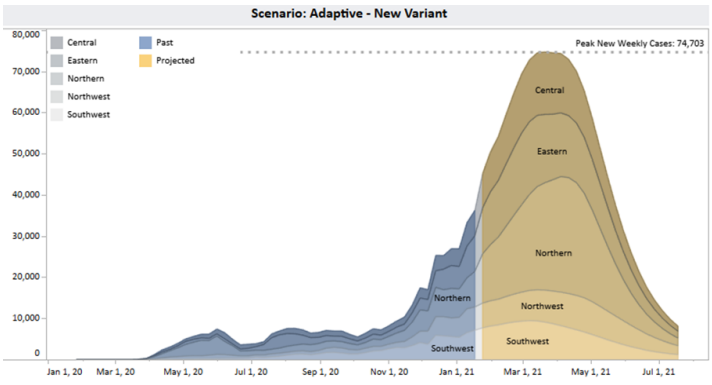
More is known about the earliest known VoC, variant B.1.1.7 first identified in the UK. Studies suggest that B.1.1.7 increases transmission by 30 to 55%. In a widely shared post, former CDC Director Tom Frieden noted that B.1.1.7 went from making up 10% of cases to 25% in just a few weeks. If added to current high case rates in the US, Frieden notes "it will be close to the worst-case scenario, with a baseline of full hospitals."

The B.1.1.7 VoC has been identified in 20 US states, including Maryland and Pennsylvania. VOCs identified in California may be driving surges there. A recent modeling study published by the CDC suggests that B.1.1.7 could become the predominant variant in the US by March. Other VoCs, however, could contribute to quicker spread.



Although seasonality, the holidays, and loosened restrictions also played a role, VoC B.1.1.7 likely drove rapid increases in case growth in Ireland and the United Kingdom, as discussed in a recent post by former CDC Director Tom Frieden.

What to Expect in Virginia



The UVA model now includes a New Variant scenario. In this scenario VoCs increase transmissibility by 40% and slowly grow to dominate existing strains by March. In this scenario, new weekly cases peak at almost 75,000. However, peaks are sustained, with 65,000 or more cases expected for 10 weeks, from late February to late April. By comparison, Virginia had about 50,000 new cases during the entire *month* of November. These sustained high rates could place unprecedented pressure on Virginia's health resources. Additionally, high case counts increase the risk that new, and perhaps more concerning, variants emerge.

However, this scenario is not inevitable. By decreasing spread now, Virginians can decrease the opportunity for VoCs to take hold in the state, lower the existing burden should it occur, and decrease the risk of new VoCs emerging. Many Virginians heeded warnings over the holidays, and the post holiday surge has not been as bad as feared. If we continue to do our part, we can give time for vaccinations, and lower transmission expected with warmer weather, to reduce the risks associated with VoCs. **Do your part to stop the spread. Continue to follow prevention best practices and get vaccinated when eligible.**