UVA COVID-19 MODEL WEEKLY UPDATE

August 14, 2020

KEY TAKEAWAYS

- Sixteen health districts are experiencing surges, with 3 new districts in the Southwest (Lenowisco, Pittsylvania-Danville, and West Piedmont) and one new district in the Central Region (Southside). Surges have abated in Henrico and Prince William.
- Model methodology has been updated this week. The new model closely traces past and current trends to predict future cases. The new model replaces the 8 scenarios shown in previous weeks.
- Projections now extend into the fall. However, considerable uncertainty remains as the impact of key seasonal effects is still unknown.
- The transmission rate remains below 1.0 and the surge appears to be declining, but case incidence remains high.

922,941

Cases Avoided since May 15

0.917

Reproduction Rate

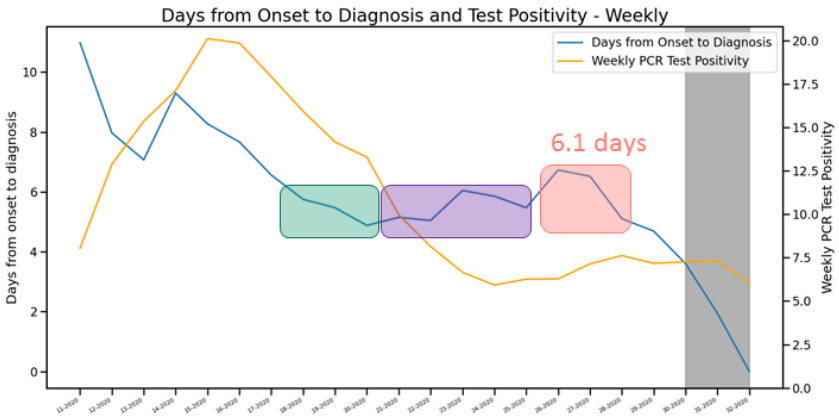
Based on onset date
7 days ending July 25th

KEY FIGURES

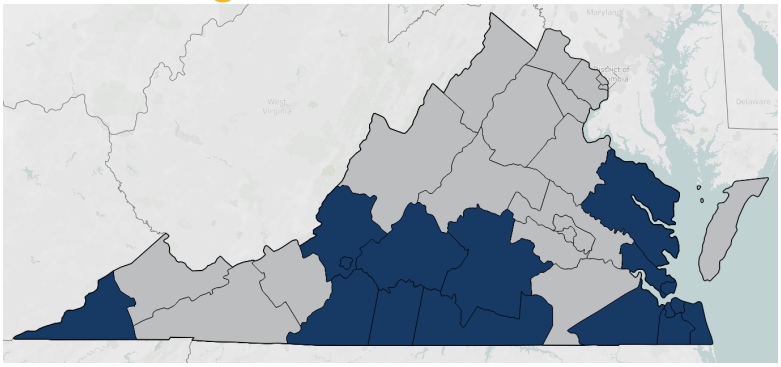
Reproduction Rate

Region	R_e August 1	Weekly Change
State-wide	**0.917**	**0.008**
Central	0.937	0.030
Eastern	0.878	0.017
Far SW	1.139	0.199
Near SW	0.908	-0.266
Northern	0.985	0.102
Northwest	0.763	-0.212

Case Detection



In Surge: 16 Health Districts



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

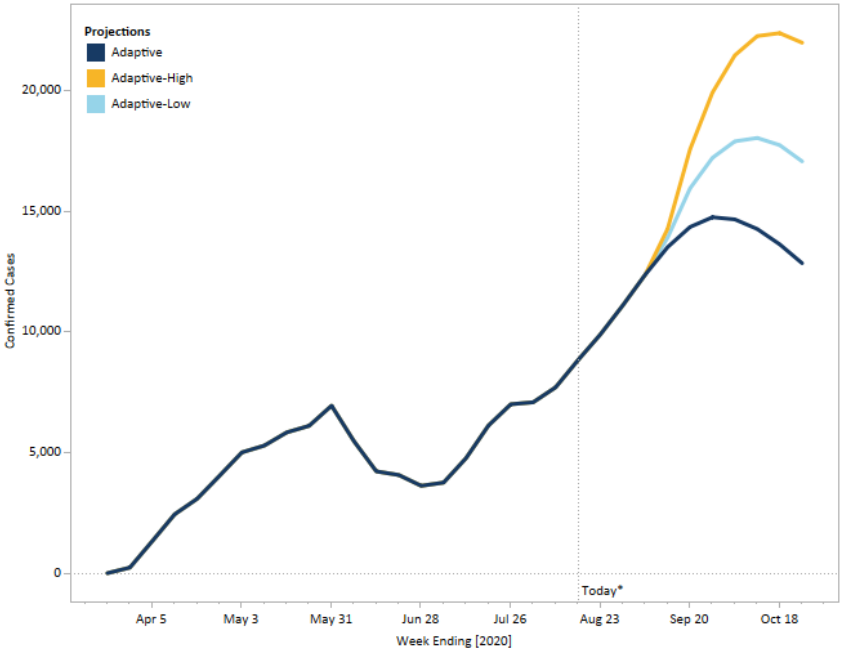
The UVA team continues to improve the model weekly. This week the model underwent a major overhaul. Now that more historical data are available, UVA switched to an "adaptive fitting" methodology, where the model precisely traces past and current trends and uses that information to predict future cases. These new projections are based on recent trends the model learns through its precise fitting of each individual county's cases. This model replaces the 8 scenarios reported in prior weeks. Each health district now has its own unique scenario.

The new model also includes two "what-if" scenarios to predict what we might see if cases increase in response to seasonal effects in the Fall, such as schools re-opening and changing weather patterns. It is still too early to know the impact that these seasonal effects will have. For now, the model assumes a 10-20% increase in transmissibility beginning on Labor Day. The model will be updated regularly to incorporate new information.

Low impact of seasonal effects: 10% increase in transmission starting September 8, 2020
High impact of seasonal effects: 20% increase in transmission starting September 8, 2020

MODEL RESULTS

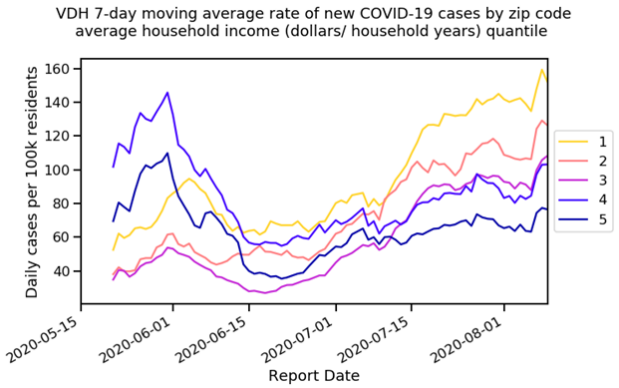
The model estimates that Virginia's cautious approach to reopening prevented **922,941** confirmed cases in Virginia since May 15 compared to a hypothetical scenario where interactions returned to 100% of pre-pandemic levels upon entering the Forward Virginia Plan. With the new modeling approach, the current course predicts a peak the week of **September 27th** with **14,743** weekly cases. Anticipated seasonal changes in the Fall could lead to a surge beginning around Labor Day with schools and universities re-opening, changes to workplace attendance, and the impact of weather patterns. With a 10% increase in transmissibility beginning on Labor Day, we would expect to see cases peak at 18,000 the week of October 11th. A 20% increase in transmissibility leads to a slightly later peak the week of October 18th with over 23,000 weekly cases.



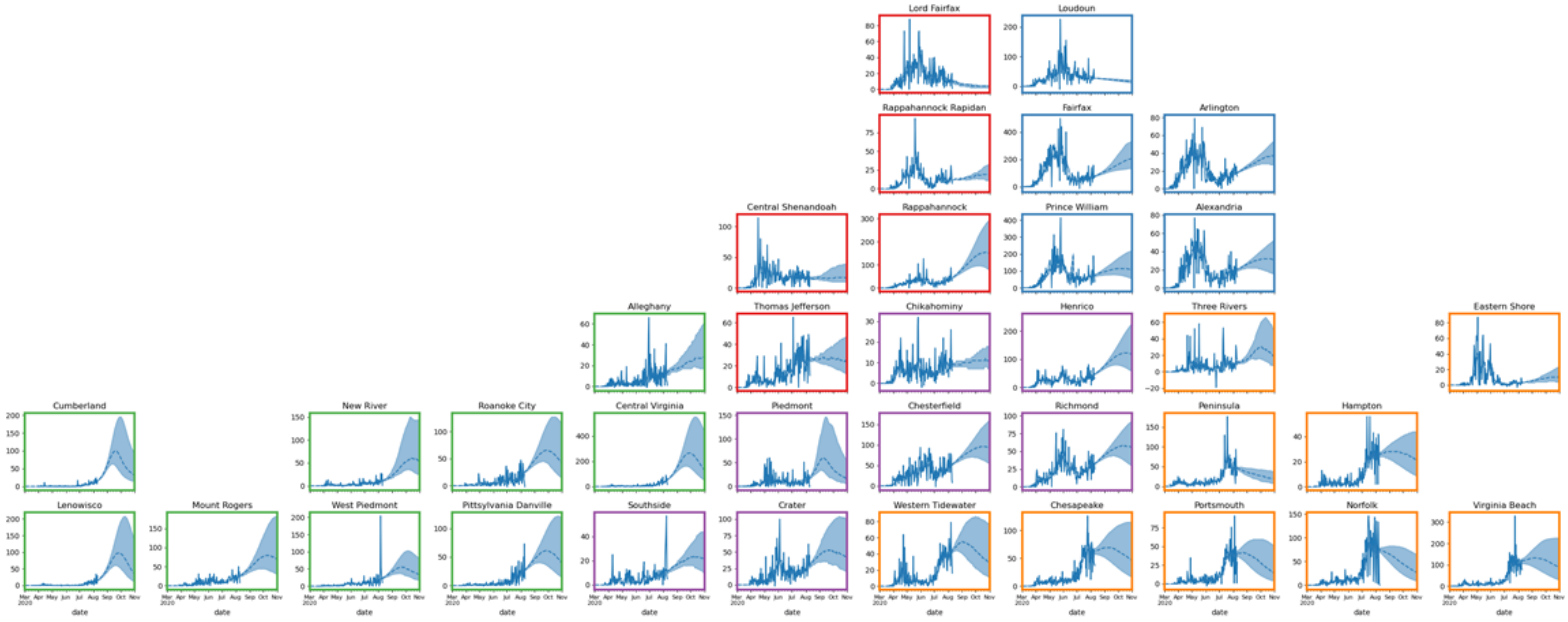
TRENDS BY INCOME AND GEOGRAPHY

As we've seen over the course of the pandemic, cases do not occur equally throughout Virginia. Disparities exist with respect to many factors, including age, race, income, and geography. Notably, Virginians reporting Latino or Black race/ethnicity experience a disproportionate burden of disease statewide. Similar patterns occur throughout the nation.

The figure to the right shows case rates since mid-May by income category. Zip codes with the lowest average household income (group 1) are shown in yellow. Zip codes with the highest average household income (group 5) are shown in dark blue. Cases declined in all zip codes in mid-June and have since increased. However, rates increased more dramatically in zip codes with the lowest average household income. Zip codes in this group now report the highest number of cases, whereas zip codes with the highest average income now report the lowest case rates.



The map below shows observed cases (dark blue line) and projected cases (blue shaded region) by health district. Case rates have fluctuated in nearly every health district since the start of the pandemic. Some districts, such as those in the Northern Region (blue boxes) and Eastern Region (orange boxes) appear to have neared or passed their peak. Others, such as those in the Southwest Region (green boxes) have not yet reached their peak.



Regardless of region or risk factor, Virginia is approaching a time of great uncertainty. We do know the Fall will bring many changes. What we do not know is how those changes will impact Virginians. Current projections suggest a continued increase in cases through September, with the potential for a greater increase if case transmission increases after Labor Day. Virginians must continue to follow public health recommendations for social distancing and proper hygiene to control the spread of disease as we approach the Fall season.