UNIVERSITY of VIRGINIA
BIOCOMPLEXITY INSTITUTE

UVA COVID-19 MODEL WEEKLY UPDATE

VDH VIRGINIA DEPARTMENT OF HEALTH

November 13, 2020

KEY TAKEAWAYS

- The UVA model projects what could happen if current conditions continue unchanged. Behavior and policy changes, along with unforeseen events, will effect projections.
- The statewide reproduction rate remains 1.0, while regional results are mixed.
- The national situation continues to deteriorate, including among states bordering Virginia. Except for DC, all bordering states have weekly cases higher than 20 per 100k residents.
- In Virginia, 25 of 35 local health districts are in growth trajectories, including eight in surge trajectories.
- National and state trends are concerning as we enter the holiday season, heralding colder weather and increased travel.

210,476
Cases Expected by Thanksgiving

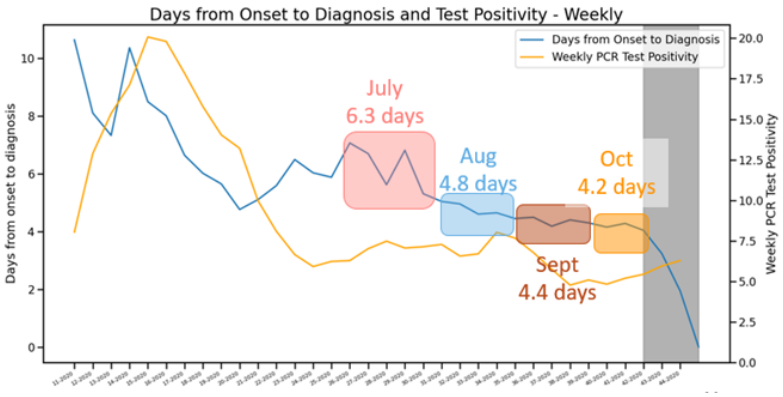
1.005
Reproduction Rate
Based on onset date
7 days ending Oct 24

KEY FIGURES

Reproduction Rate

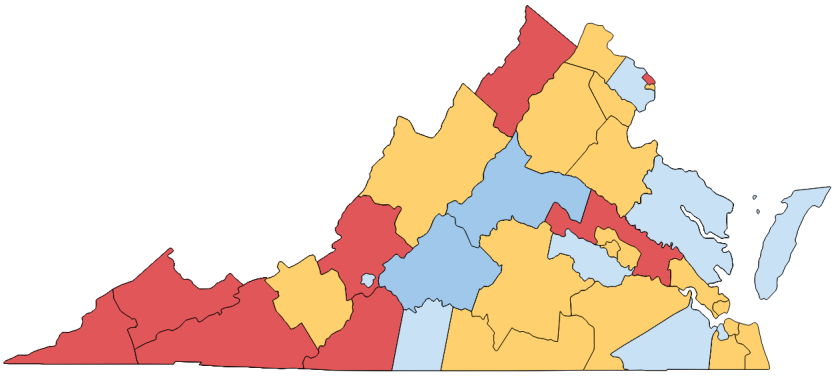
Region	R_e Oct 31	Weekly Change
State-wide	**1.005**	**-0.082**
Central	0.929	-0.151
Eastern	1.100	0.054
Far SW	0.986	-0.380
Near SW	0.952	-0.072
Northern	1.060	-0.032
Northwest	1.000	-0.074

Case Detection



Growth Trajectories: 8 Health Districts in Surge

Status	# Districts (last week)
Declining	2 (5)
Plateau	8 (10)
Slow Growth	17 (17)
In Surge	8 (3)



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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.

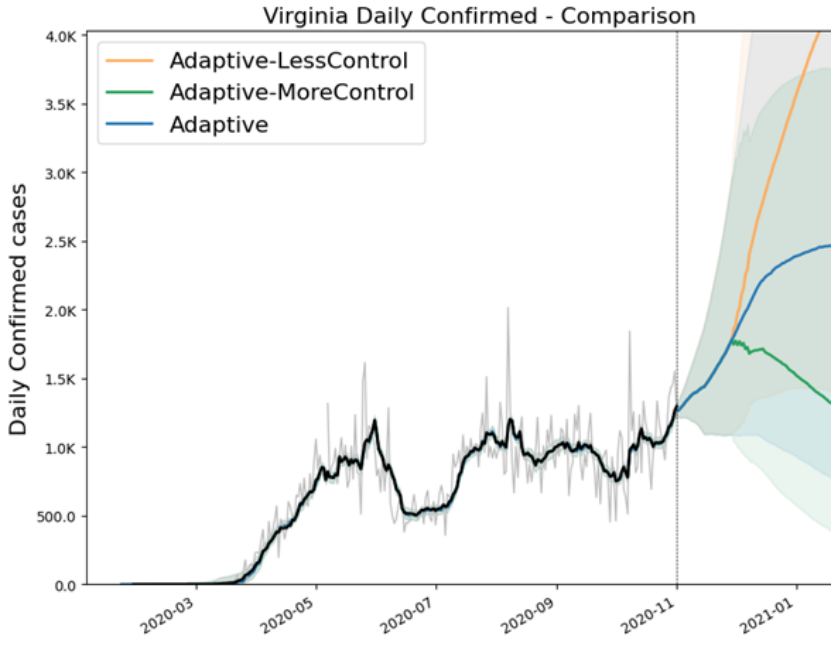
THE PROJECTIONS

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 November 26, 2020
More control of seasonal effects: 15% decrease in transmission starting November 26, 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 25,000 weekly cases on February 14.** If we continue on this trajectory, we would expect over 208,000 total confirmed cases by Thanksgiving. However, there are a number of risks on that could influence case growth over the next several weeks, including fall weather, the holiday season, and a national surge in cases. If these result in a jump in case growth, cases could peak at over 47,000 per week by mid-February. However, if Virginians respond by improving prevention efforts such as hand washing, social distancing, wearing masks, and avoiding indoor gatherings, cases could peak in early December, at just under 15,000 cases per week. Virginia's health is in our hands. Follow guidance in the Forward Virginia plan to help control COVID.



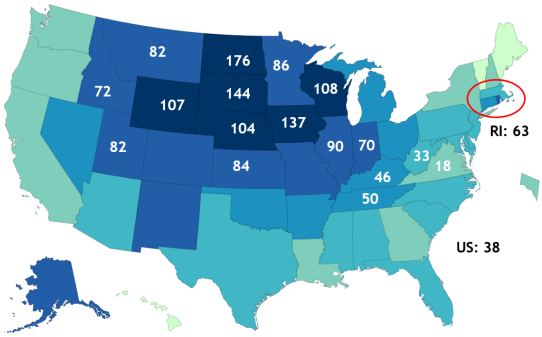
VIRGINIA'S HEALTH IS IN OUR HANDS. Do your part, stop the spread.

CONCERNING TRENDS CONTINUE

Last week we discussed some concerning trends occurring nationally and in states bordering Virginia. These trends are continuing. and pose a substantial risk to Virginia's success in managing the COVID-19 pandemic. With this in mind, we will continue to highlight these trends.

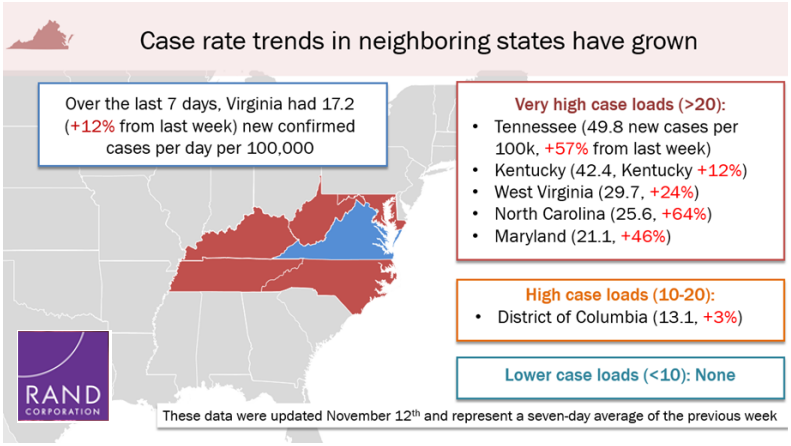
The National Situation

Nationally, weekly incidence jumped from 27 cases per 100k resident to 38. The latest wave began in the Dakotas and is radiating outward. While weekly cases per 100k residents continue to increase in the Dakotas, the most concerning growth occurred in nearby states. Last week, only the Dakota's had weekly incidence above 100 per 100k residents. Now six do. Only six states were over 70 on the same metric last week. That number has jumped to 13.



Weekly Cases per 100k Residents by State, Nov. 12, 2020. Compare to last week. Source: CDC COVID Data Tracker.

Closer to Home



With the exception of Washington DC, the COVID-19 situation in neighboring states continues to deteriorate. All states (excluding DC) saw double digit percentage increase in incidence. Likewise, all are experiencing weekly incidence over 20 per 100k residents, categorized as "very high" by our partners at RAND Corporation. Virginia, with its lower "high" weekly incidence of 17 per 100k, increasingly looks like an island. Especially as states like West Virginia and Maryland, which had lower incidence previously, experience large jumps.

In Virginia

Virginia's incidence is high, but lower than the very high case loads in neighboring states and the exceptionally high case loads in some Midwestern states. This, however, could change rapidly. So far, very high incidence in Virginia has mostly occurred in rural counties, concentrated in Southwest Virginia. If incidence begins to increase in more populous areas of the Commonwealth statewide case loads could increase dramatically, and strain on health resources along with it. As the trajectory map on Page 1 shows, more local health districts encompassing urban and suburban counties are in slow growth trajectories with a few experiencing surges.

Outlook

Unlike previous surges, which were regional and relatively short-lived, there is reason to think this latest wave will continue to run. An analysis by our partners at the UVA Biocomplexity Institute found that winter weather is associated with increases in transmission rates. This may explain why Europe is also experiencing a surge in cases. The holiday season is also approaching. Travel, including students returning home for holiday breaks, could lead to increased transmission. Family and community gatherings, which we all look forward to over the holidays, are a significant source of transmission. Virginians should take steps now to prevent a larger surge. It is essential that all Virginias do their part to stop the spread by practicing basic prevention, following the guidance in the Forward Virginia plan, and protecting families and friends during the holidays. Virginia's health is in our hands.