August 7, 2020

KEY TAKEAWAYS

- Fourteen health districts are experiencing surges, including eight in the Hampton Roads area.
- Surges in Arlington, Pittsylvania-Danville and Rappahannock - Rapidan abated. New surges (re)emerged in Three Rivers, Piedmont, Prince William, Alleghany, Roanoke and Henrico.
- The model improved surge scenarios by projecting end dates based on recent evidence. See Page 3 for details.
- On current course, Virginia is projected to have almost 7,200 weekly confirmed cases by late August.
- The state wide reproduction rate remains below 1.0. Early rates remain volatile. The July 18 estimate is above 1.0 with updated data included.

871,000

Cases Avoided since May 15

. . . .

0.909

Reproduction Rate
Based on onset date
7 days ending July 18th

KEY FIGURES

Reproduction Rate

Region	R0 July 25	Weekly Change
State-wide	**0.909**	**-0.051**
Central	0.907	-0.030
Eastern	0.861	-0.138
Far SW	0.940	-0.514
Near SW	1.174	0.070
Northern	0.883	0.028
Northwest	0.975	0.180

Case Detection

Days from Onset to Diagnosis and Test Positivity - Weekly

5.9 days   5.9 days   5.0 days
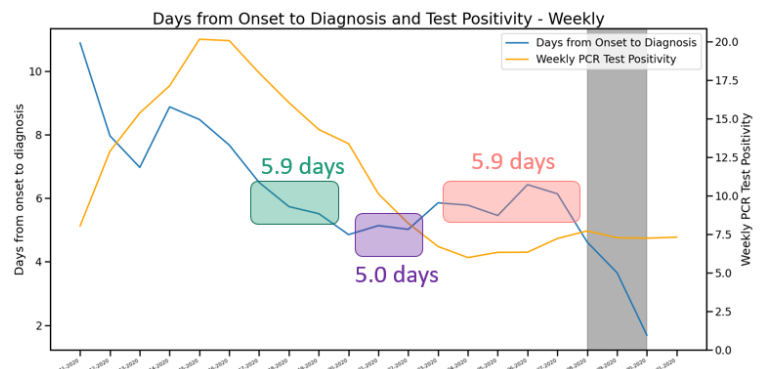
In Surge: 14 Health Districts
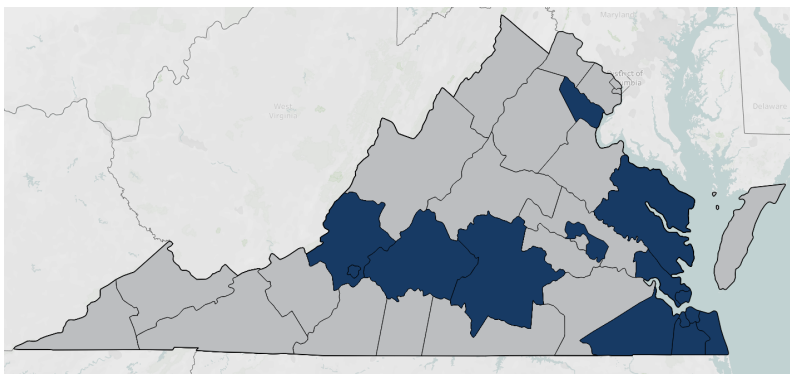
Scenarios

Scenario	Last Week	This Week
Steady, Better Detection	1	1
Steady, Better Detection, Surge	3	3
Light Rebound, Better Detection	15	7
Light Rebound, Better Detection, Surge	1	8
Steady	4	5
Steady, Surge	4	5
Light Rebound	3	4
Light Rebound, Surge	4	2

More Cases

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 has been continuously improving the model. Previously, we presented a number of scenarios. With recent improvements, we've decided to show two projections: the "Current Course" and "With Surge" scenarios. We also continue to use the "Full Rebound" scenario as the basis to estimate the affect of community mitigation and public health measures.

Full Rebound: Once public health restrictions are lifted, interactions return to 100% of pre-pandemic levels, with transmission returning to its pre-March 15 rate.

Current Course: The model examines the past and most recent case growth rate, along with other factors, in each of Virginia's 35 health districts to determine the strength of the rebound after May 15 in each district. It also examines whether the district has experienced a recent "surge" in cases. This information is used to model the current course of the pandemic locally.

With Surge: States that reopened early tended to experience a surge in case growth rates 4-6 weeks after reopening. This scenario examines anticipated cases if Virginia were to experience a surge 4 weeks after entering Phase III of the Forward Virginia plan. Communities respond to surges by changing behavior, often limiting the duration of surges.

MODEL RESULTS

The model estimates that Virginia's cautious approach to reopening prevented **871,000** confirmed cases in Virginia since May 15 compared to the estimates in the Full Rebound scenario. Improvements in the model this week, which take into account behavioral changes during a surge, led to reductions in projected near-term peaks. In the Current Course projection, new weekly cases are expected peak at almost **7,200** in late August. With a statewide surge, that increases to almost **9,900**. However, the projections assume that residents and communities improve their prevention efforts during a surge. If they don't, or if schools and universities reopening lead to increased case growth, cases could peak at a much higher level later this fall.
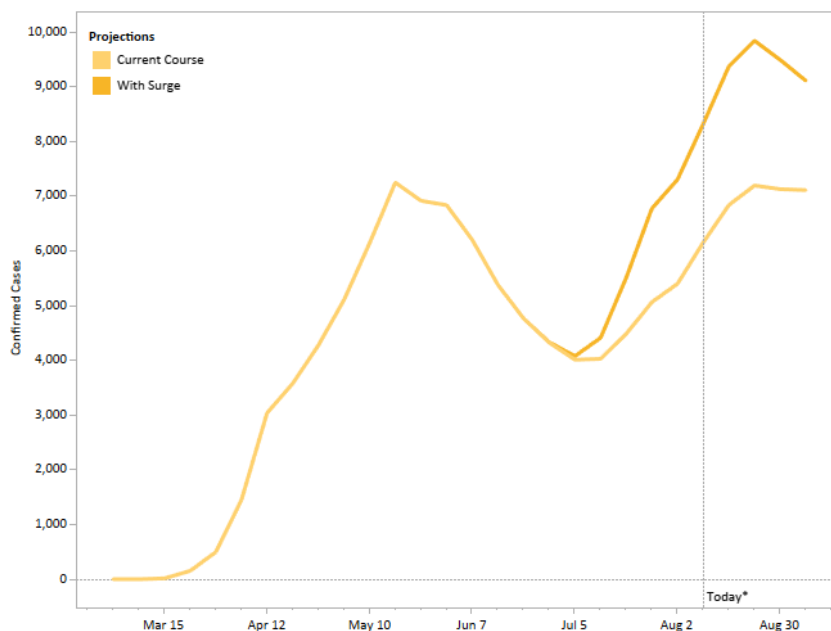
What do we know about surges?

For the past couple of weeks, the UVA COVID-19 model has incorporated "surges" into its model. Surges were included based on strong evidence from other states. States which lifted public health restrictions early tended to see a spike in new case growth rates about 4 weeks later, resulting in a surge in new confirmed cases. However, like most things COVID-19 related, we knew little about these surges, particularly how they would affect Virginia. How strong would surges be? Would surges spread uniformly across the state, or regionally? Would the phased approach in the Forward Virginia plan result in lighter surges, or avoid surges entirely? How long would they last?

Fortunately, we are learning more every day. Although the information available is still limited we are able to begin answering some of these questions. Based on very limited data, it appears that the growth rate during surges is about half of the rate before stay at home orders were put in place. This estimate is preliminary, and should improve in the coming weeks. As we have already seen, in Virginia did not avoid surges, but they are occurring regionally, mostly affecting the Hampton Roads region so far.

Most promising, however, is that the spike in growth rates does not seem to last too long. Rather, communities respond to a surge in cases by changing behavior. Community members increase prevention efforts such as social distancing, hand washing and wearing masks. Businesses follow guidelines more closely, sometime encouraged by increased enforcement efforts. Finally, public health agencies and private health systems create surges of their own, rallying to meet the growing threat.

The new Current Course scenario takes these behavior changes into account. Rather than allowing the surges to run indefinitely, this week's projections limit their duration. In some cases, particularly in the Hampton Roads area, the spike in case growth rates has already ended. In the chart to the right, both the surge and the end of the surge in Norfolk are apparent. Where that has occurred the model uses that date as the end of the surge. Otherwise, it uses information from other states and from Virginia to estimate the duration of a surge. The With Surge scenario projects a surge beginning on July 29th, 28 days after Virginia entered Phase 3 of the Forward Virginia plan, for all Local Health Districts not already in a surge. The duration of these surges is also limited. In all cases, localities return to the scenario they were on before after the real or projected end date.
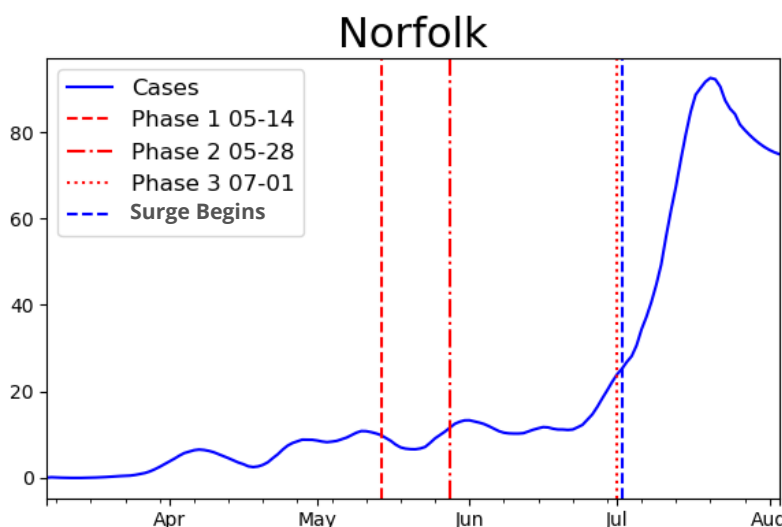
This update has produced lower projections than in previous weeks. With a novel virus, an unprecedented global pandemic, and an unprecedented response, these improvements are expected and welcome. (There are plenty of underlined examples of models NOT being updated when new information becomes available. The results are bad!) We expect more updates in the future, including updates to the surge scenarios.

So far, the data on surges is limited. It is unclear if the "end" of a surge results in a decline in new cases or a plateau. Communities are still learning the best way to respond to the pandemic and behavior may change in the future. National news, including news about surges in other states and changing views by leaders on prevention measures, may have influenced behavior-something unlikely to be repeated in the future. Unforeseen events like hurricanes or political movements may also lead to surges. Finally, some foreseen events, including schools and universities reopening and the beginning of autumn weather, are likely to influence the spread of COVID-19. But how, at this point, remains uncertain.