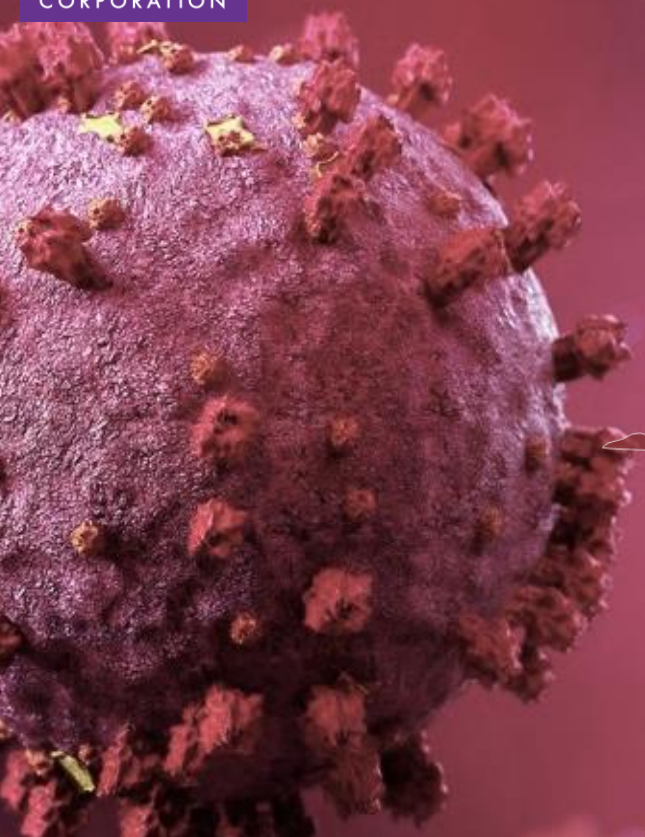
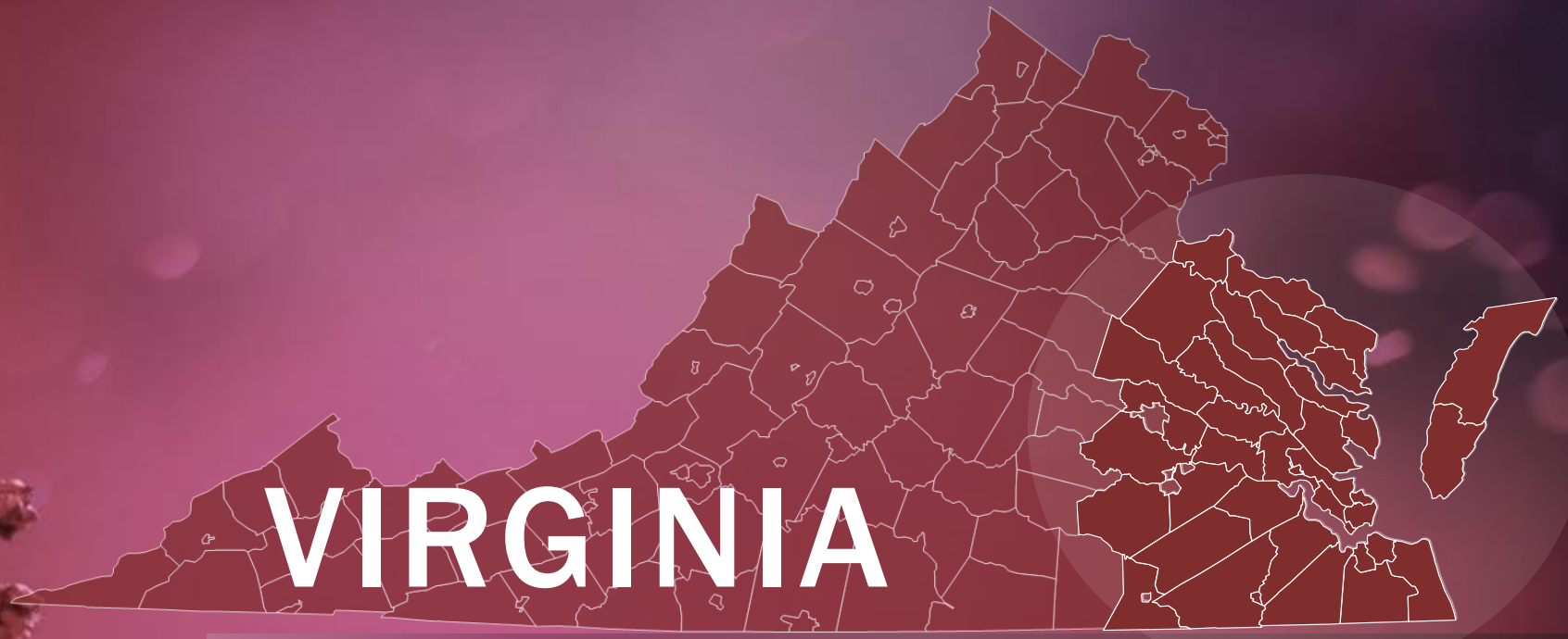




VIRGINIA

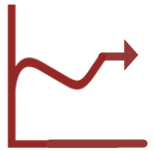
COVID-19 Update September 10th, 2020

Carter C. Price, Ph.D.

A team of RAND researchers was asked by the Commonwealth of Virginia to review available information on COVID-19 models of the commonwealth to determine the strengths and weaknesses of each model and their relevance to decisionmaking. The work of the research team will be documented in a forthcoming RAND research report. The information in this presentation is intended to keep policymakers abreast of the latest findings of the research team.

This research was sponsored by the Commonwealth of Virginia and conducted by the RAND Corporation. RAND is a research organization that develops solutions to public policy challenges to help make communities throughout the world safer and more secure, healthier and more prosperous. RAND is nonprofit, nonpartisan, and committed to the public interest. For more information, visit www.rand.org.

Bottom-Line Up Front



Virginia's total case level has plateaued

- The case rates have risen along the border with North Carolina
- The decline in hospitalizations has stopped

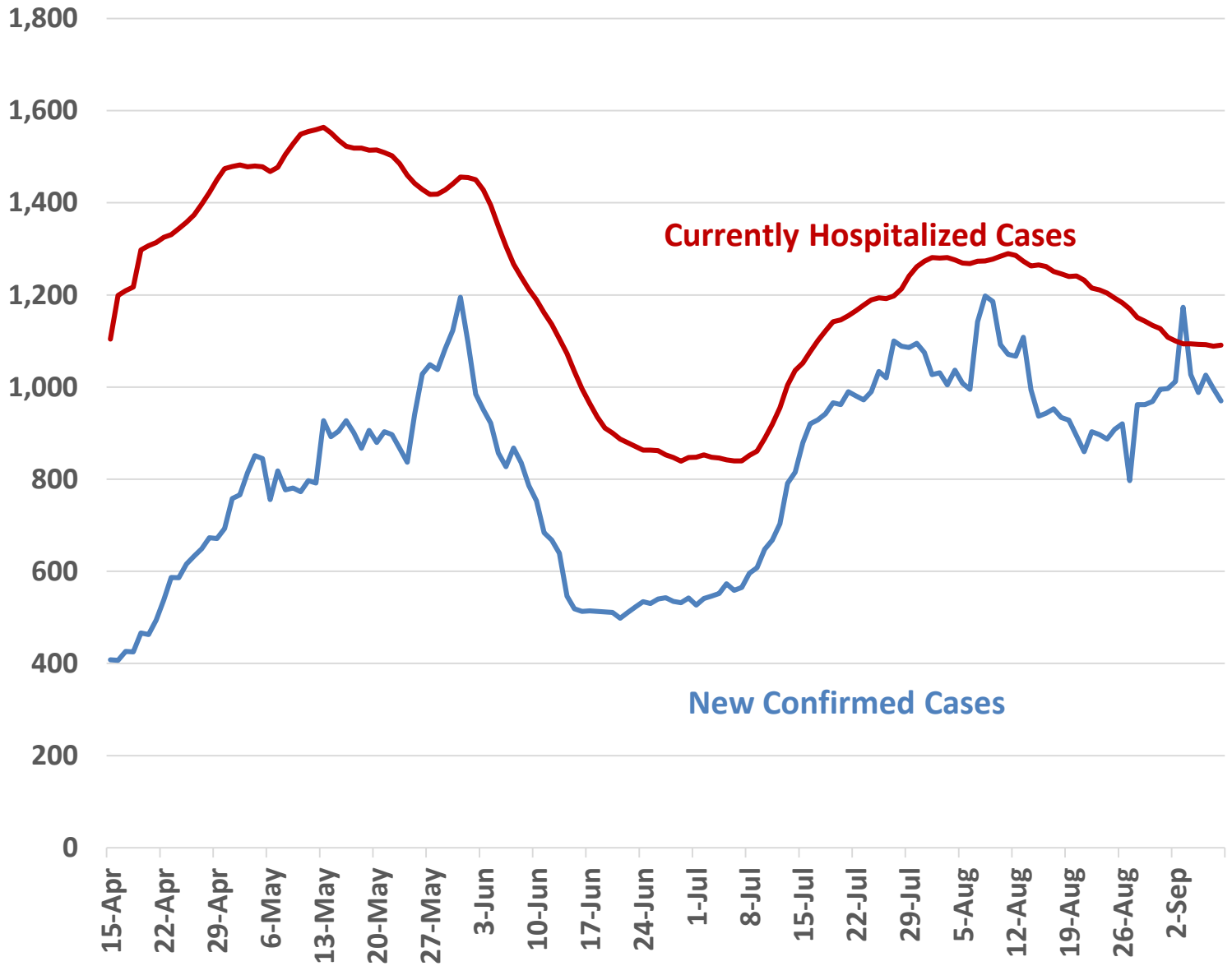
Additional triggers could lead to a rapid rise in the near term

- Seasonal changes
- Distancing fatigue
- In-person school beginning in some places
- Increased interstate travel
- Hurricane season

Modeling is less useful for forecasting because behavioral responses are driving current trends

- However, models will continue to be very useful for comparing policies and exploring scenarios
- In particular, models could be useful for understanding the effects of these triggers

The current trends indicate the latest wave is continuing



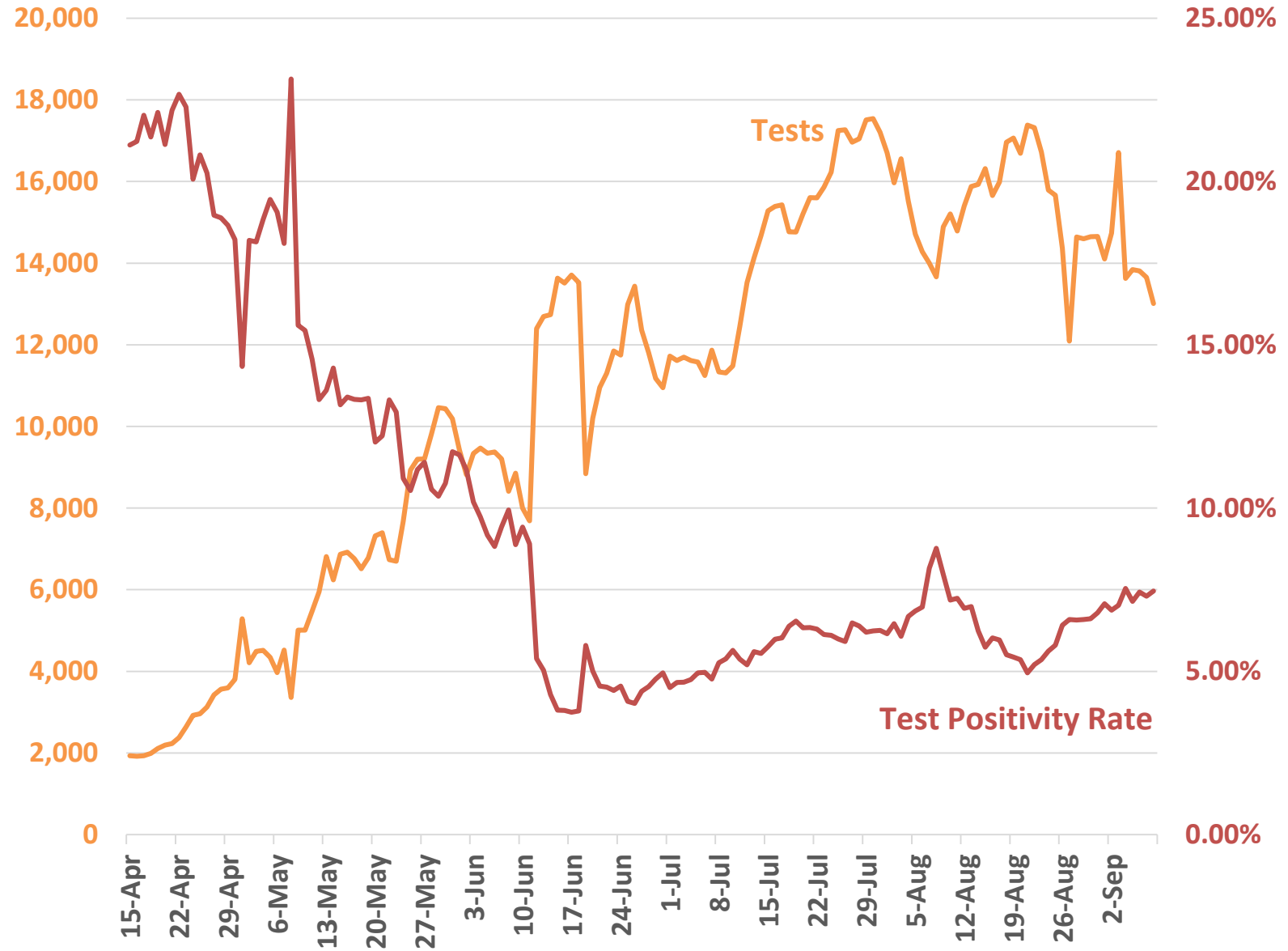
New confirmed cases have plateaued

- Cases are up slightly from last week
- Any effects from reopening schools won't likely show up for another few weeks (many have been delayed or are remote for the time being)

Currently hospitalized cases have stopped declining

- This is a lagging indicator and so will likely move within a range until a significant movement in the case trends

Testing levels are below the target range for a test-and-trace strategy



Tests per day have dipped

- Testing levels are close to an appropriate pace for a test-and-trace strategy
- Further reopening is estimated to require five times more testing along with lower case rates (See Rockefeller Foundation)

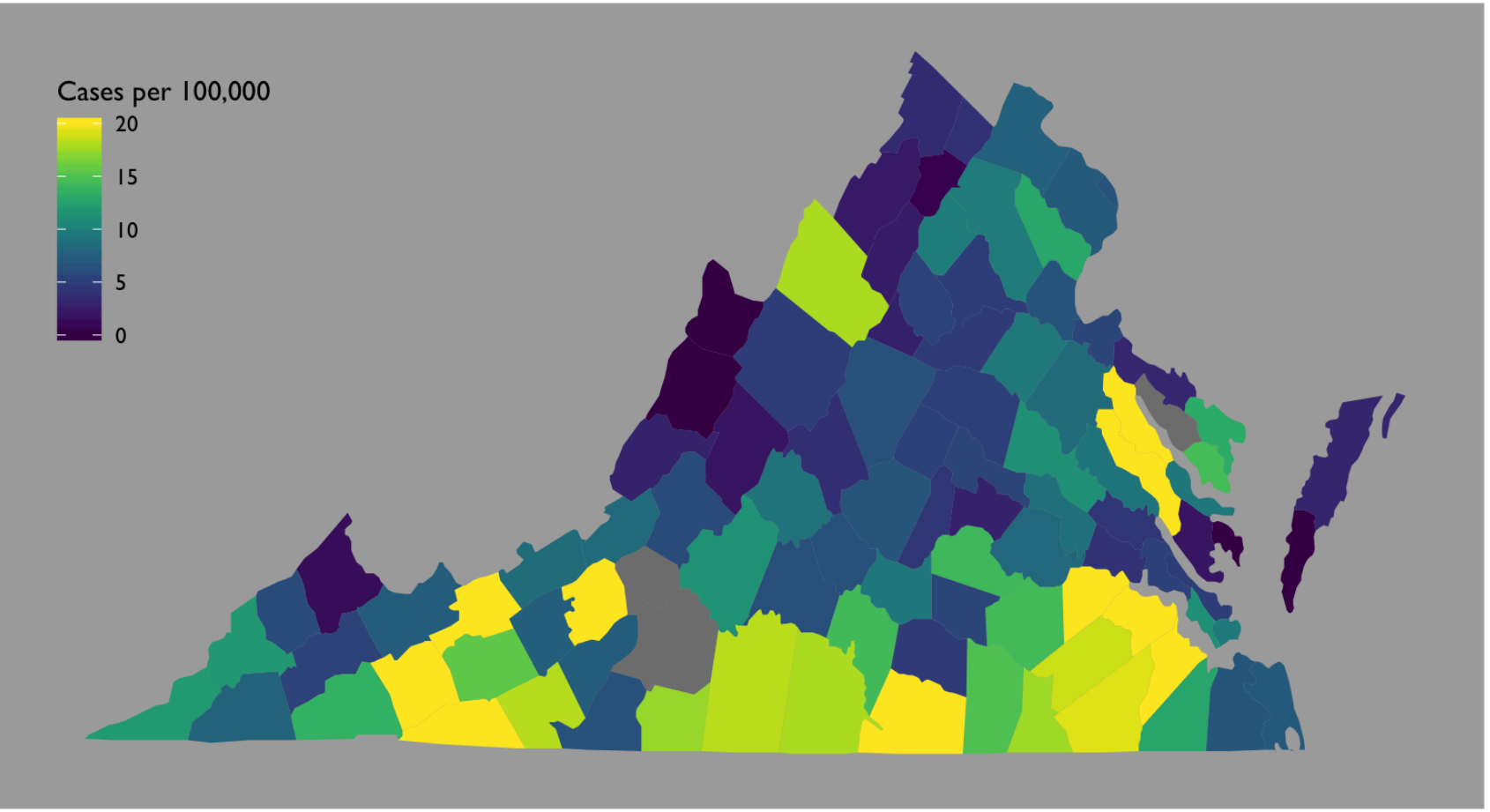
The test positivity rate is above seven percent and has been drifting up for the last two weeks

- Five percent is a suggested target

Per capita new cases are highest in the southern counties

CASE COUNT

Source: VDH



Yellow indicates at least 20 cases per 100,000

Virginia's southern counties have continued to see high case levels

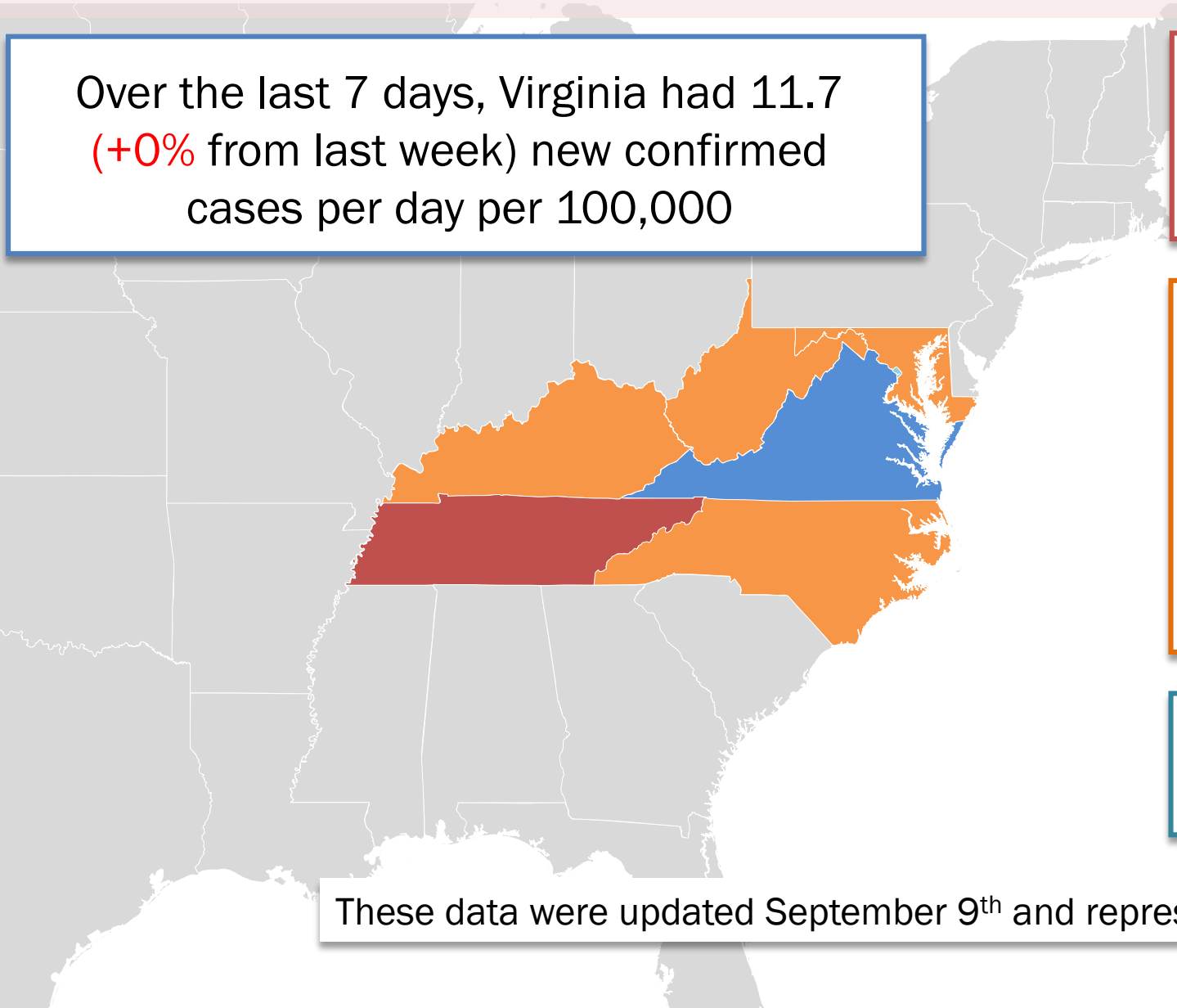
- Many of these counties have had increases

Elsewhere case counts were generally flat compared to last week

These data were updated September 9th and represent a seven-day average of the previous week

Virginia's neighboring states may have plateaued

Over the last 7 days, Virginia had 11.7 (+0% from last week) new confirmed cases per day per 100,000



Very high case loads:

Tennessee (22.0 new cases per 100k, +1% from last week)

High case loads:

- Kentucky (14.9, +4%)
- North Carolina (14.5, -3%)
- Maryland (10.9, +28%)
- West Virginia (10.6, +39%)

Lower case loads:

- District of Columbia (7.1, -8%)

These data were updated September 9th and represent a seven-day average of the previous week

Assessment of the near-term

	Current Hospital Census	Near-term Forecasts
Values:	**Confirmed: 800** **Pending: 272**	**Near-term: Cases estimated to decline 3% next week and remain near that level until late September** **Longer-term: Cases are expected to begin rising again in late September**
Notes:	This is about the same as last week	Second peak is estimated to have occurred in the past A third peak is expected to occur sometime after November 1st
Source:	Virginia Hospital and Healthcare Association https://www.vhha.com/communications/virginia-hospital-covid-19-data-dashboard/ Accessed 9/9/2020	Youyang Gu http://covid19-projections.com/us-va Accessed 9/9/2020

There are several triggers that could lead to increased spread

Trigger	Likely effect	Timeframe
Seasonal changes	Increased transmission as people spend more time indoors and virus persists longer in cooler/less sunny settings	Increasing as the weather gets cooler
Distancing fatigue	Increased transmission as people are less rigorous about distancing	Gradual and continuous
In-person school	School reopenings become super-spreader events or students return with COVID from out-of-state	Now
Hurricane season	Evacuees catch or spread COVID	Now to November
Increased interstate travel	People from out-of-state spread COVID	Gradual and continuous

These triggers are likely to lead to increased spread

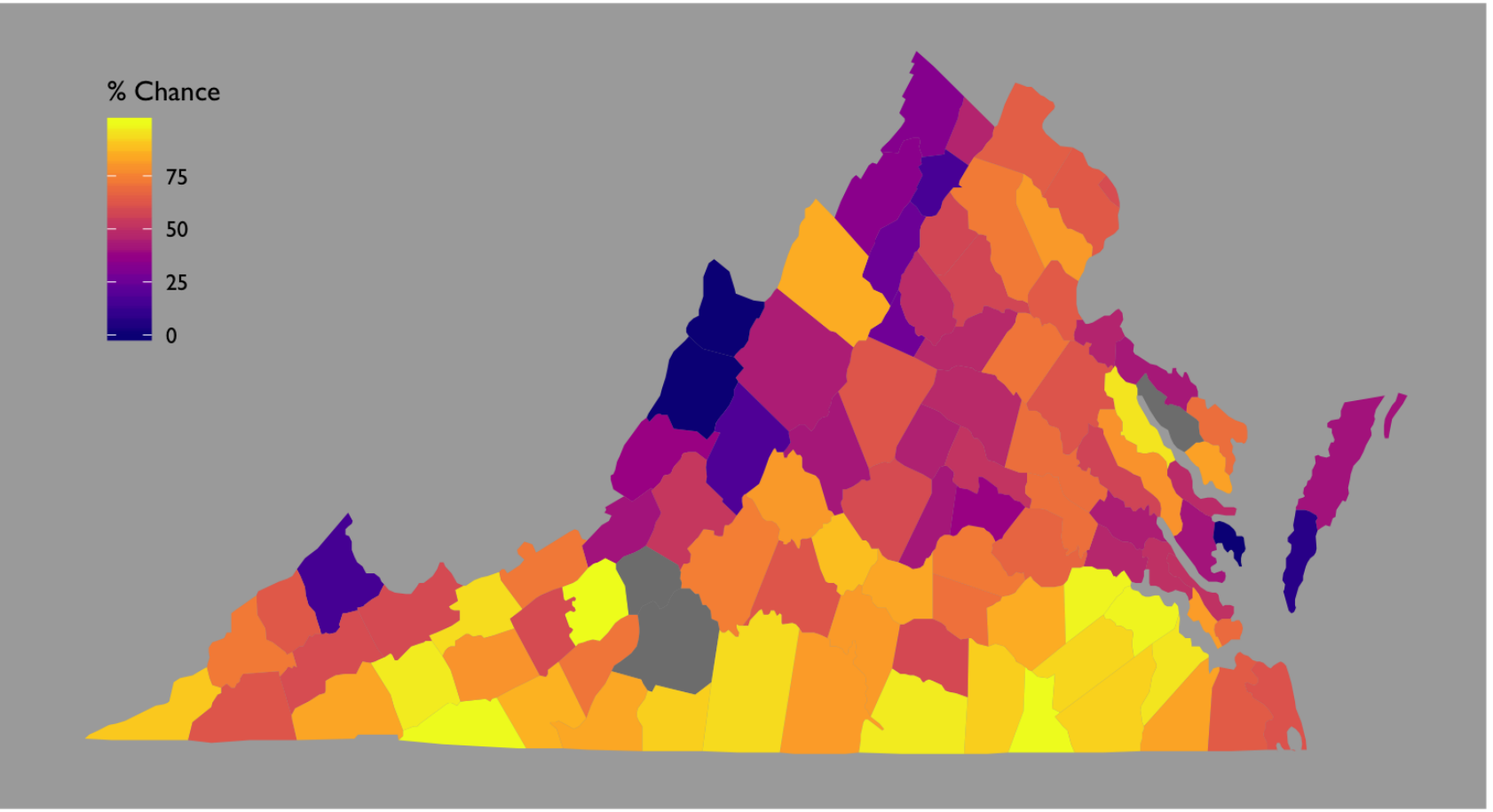
- Some of the triggers could have an impact now and others will build up over time

Aside from a policy intervention or unexpected behavioral change, there are not comparable triggers to reduce the spread

- Interventions should be considered in advance

Most of Virginia has better than even odds of an infected person in a school of 500 in the first week of in-person classes

Probability of at least one case in a school of 500



101 of Virginia's counties have more than a 50 percent chance of an infected person arriving in the first week

- Half of the counties have more than a 66 percent chance

Southern counties have the highest risk

In-school transmission risk will depend on precautions

These estimates are based on an approach similar to that of Fox, et al., using data from VDH and UVA

We've been monitoring recent, relevant literature

Blau et al., estimated the demographic characteristics of the frontline and essential worker populations

- The essential worker population is close to the distribution of the broader labor force demographics
- However, frontline workers, those essential workers who need to be physically at a job site, were disproportionately male, disadvantaged minorities, and had less education and lower wages

Several vaccine studies and models have been published recently

- Emanuel et al., developed a framework for distributing vaccines based on maximizing life-years saved
- Mello et al., summarize lessons learned from previous vaccine mandates and stress the importance of preparing infrastructure for delivery and side-effect surveillance
- Jeyanathan et al., detailed current vaccine candidates, assessed the timelines, and highlighted risks
  - There will be several bottlenecks in the development and deployment processes
  - Planning for messaging and distribution infrastructure should begin soon to mitigate these constraints

Ettman et al., used a nationally representative panel survey of 1,441 adults to study the prevalence of mental health issues before and during the pandemic

- Depression prevalence has risen more than 3-fold since before the pandemic, particularly among those with lower social and economic resources or exposure to other stressors
- Post-pandemic plans need to account for a higher prevalence of mental health issues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