

Situation Report 9: COVID-19 transmission across Washington State

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Revised to add explicit comparison to Florida data in Figure 3.

Results as of July 17 2020 5 p.m. Incidence data through July 02 2020.

From week to week, we will be highlighting situations around the state that we think warrant special attention. For a comprehensive and up-to-date picture of what's happening around the state, see the [WA State COVID-19 Risk Assessment](#) and [WADoH COVID-19 data](#) dashboards.

Summary and highlights

This situation report shows that Washington State as a whole is in an explosive situation. Transmission continues to increase or accelerate across most of Washington state and will continue to do so unless concrete steps are taken to stop the spread. All indicators of the extent of viral spread are higher than last week with the exception of Yakima. In both eastern and western Washington cases are increasing fastest among 20-29 year olds and are also growing in both younger and older age groups around them. There is no progress to zero; the level of daily new cases is substantially higher than the state's previous peak in March.

R_e for western Washington is similar to our previous report, likely between 1.34 and 1.73, with best estimate **1.54**. For eastern Washington R_e is higher but statistically similar to last week's report, likely between 1.29 and 1.53, with best estimate **1.41**. In Yakima the estimated R_e is likely between 0.65 and 1.22 with best estimate 0.94. Yakima's previously sharp turnaround appears to be plateauing. Spokane's exponential growth shows no signs of slowing.

Hospitalization rates are just starting to increase in western WA and continue to grow across all age groups in eastern WA. As transmission moves from younger adults into older more vulnerable populations, we expect new hospitalizations and eventually deaths to trend up across the state.

Implications for public health practice

Washington State is in the early stages of an exponential statewide outbreak that has zero chance of being reversed without changes to our collective behavior and policies to support that change. If current trends continue, we expect that [schools will not be able to reopen safely in the fall](#). Further transmission control will require enhanced compliance with masking and distancing policies and further restricting gatherings that likely fuel virus spread. This is a matter of utmost urgency as we have seen from the beginning of the pandemic that [measures enacted sooner have vastly greater efficacy](#).

Key inputs, assumptions, and limitations of our modeling approach

We use a COVID-specific transmission model fit to testing and mortality data to estimate the effective reproductive number over time and the associated COVID-19 prevalence. The key modeling assumption is that individuals can be grouped into one of four disease states: susceptible, exposed (latent) but non-infectious, infectious, and recovered.

- For an in-depth description of our approach and its assumptions and limitations, see [this earlier report](#).
- In this situation report, we use data provided by Washington State Department of Health through the [Washington Disease Reporting System \(WDRS\)](#). **We use the WDRS test and death data compiled on July 14, and to hedge against delays in reporting, we analyze data up to July 2 in both Western Washington and Eastern Washington.**
- Estimates of R_e describe average transmission rates across large regions, and **our current work does not separate case clusters associated with known super-spreading events from diffuse community transmission.**
- Results in this report come from data on testing, confirmed COVID-19 cases, and deaths (see [previous WA State report](#) for more details). Also as described [previously](#), estimates of R_e are based on an adjusted epi curve that accounts for changing test availability, test-positivity rates, and weekend effects, but all biases may not be accounted for. **In particular, situations with large, rapid testing volume increases introduce additional uncertainties that can only be fully resolved with longer time series. We emphasize however that increased testing volume is an overwhelmingly positive thing. Despite the short term uncertainty test volume changes introduce into metrics of COVID-19 transmission, increased testing is essential to identifying high-risk settings, preventing onward transmission, and linking people to care.**
- This report describes patterns of COVID transmission across Washington state, but it does not examine factors that may cause differences to occur. The relationships between specific causal factors and policies are topics of ongoing research and is not addressed herein.

Collaboration Notes

The Institute for Disease Modeling (IDM), Microsoft and the Fred Hutchinson Cancer Research Center are working with WADoH to provide regional modeling of case, testing, and mortality data across Washington State to infer effective reproduction numbers, prevalence, and incidence from data in the Washington Disease Reporting System. This report is based on models developed by IDM that are being advanced to better represent the state by Microsoft, and both together volunteer to support WADoH in its public health mission. This collaboration has evolved alongside the science, data systems, and analysis behind the models, and it reflects the ongoing commitment of all parties involved to improve our understanding of COVID-19 transmission. This collaboration and its outputs will continue to evolve as scientific frontiers and policy needs change over time.

With recent effective reproductive numbers definitively above 1, we have complete confidence that the COVID-19 epidemic was growing in both eastern and western Washington through June. Without any changes the burden on all our communities will accelerate in the coming weeks.

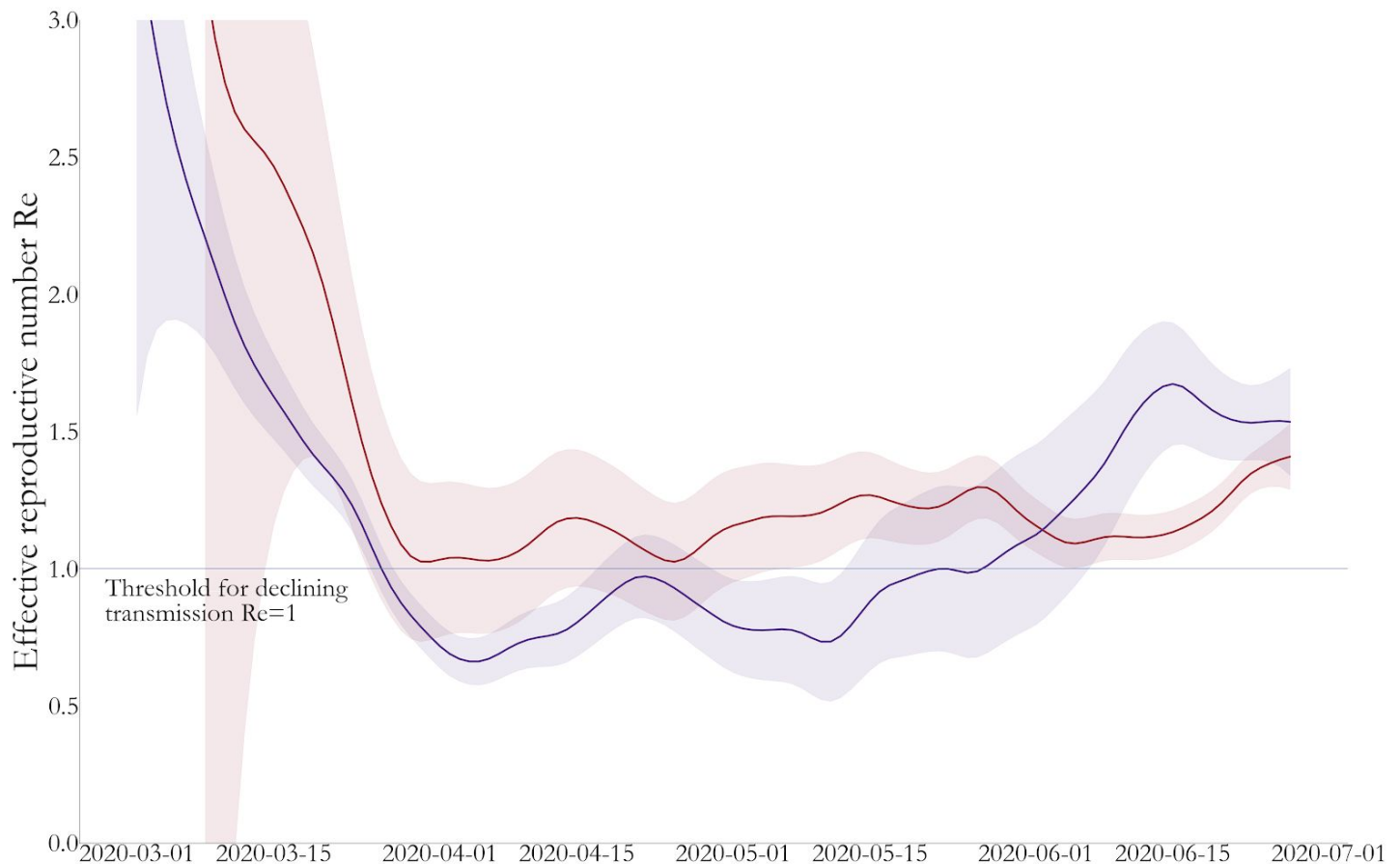


Figure 1: R_e estimates for eastern (red) and western (purple) WA, with the ribbon indicating two-standard deviation confidence intervals. Our most recent estimates suggest that R_e is above 1 in both eastern and western WA, with increased confidence relative to past situation reports. For details on how these estimates are generated, see our [technical report](#).

As the growth rate of daily new cases accelerates, daily hospitalizations have begun to increase in western WA and continue to rise in eastern WA.

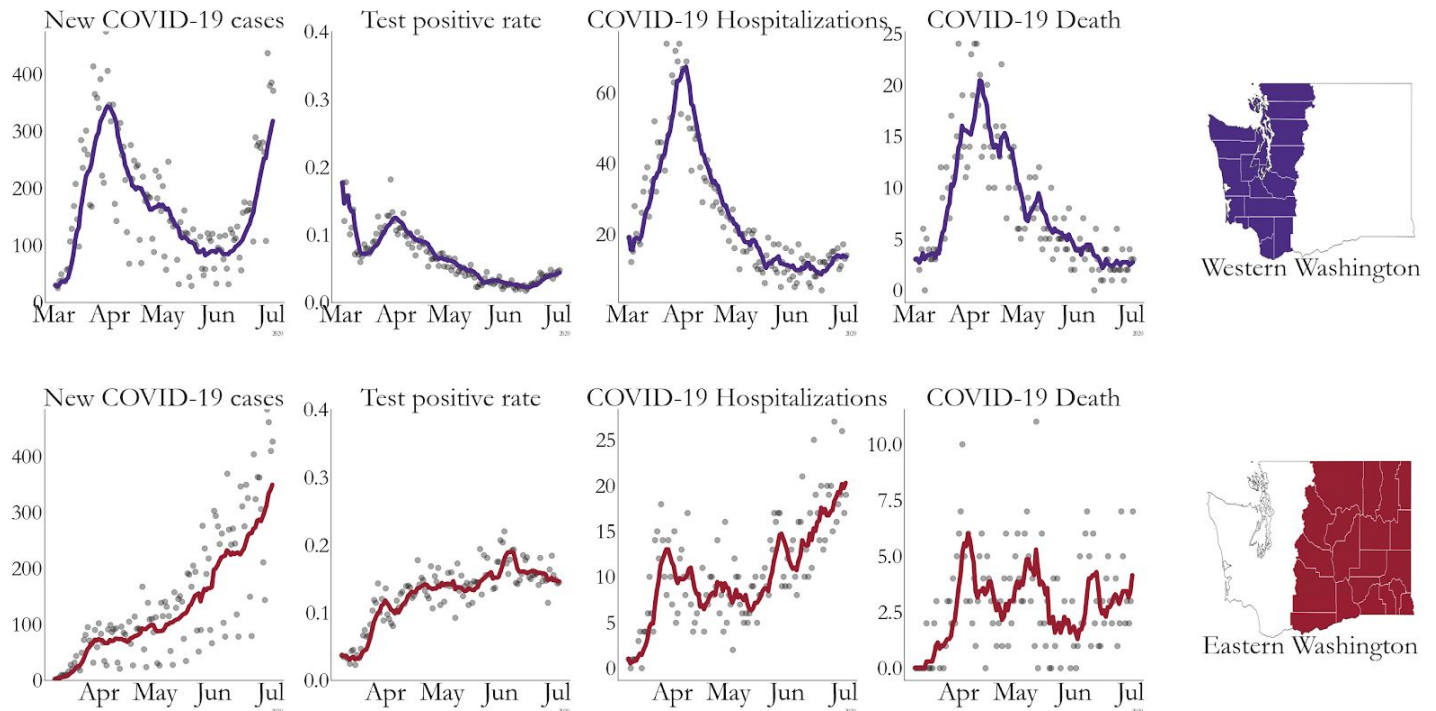


Figure 2: Cases, test-positivity, hospitalizations and deaths (daily data, dots) are smoothed with a 7-day rolling average (curves) to highlight trends. The increases in cases, test-positivity, and new hospitalizations all indicate that COVID-19 continues to surge across the state. [As seen all over the country, cases are leading indicators of hospitalizations and deaths.](#) Following the observed progression from cases to hospitalizations across the state, we expect rising deaths to follow in the next couple weeks, as may already be starting in eastern WA.

Across the state, the recent epidemic growth led by 20-29 year-olds is spreading into all age groups, including low but increasing rates among children.

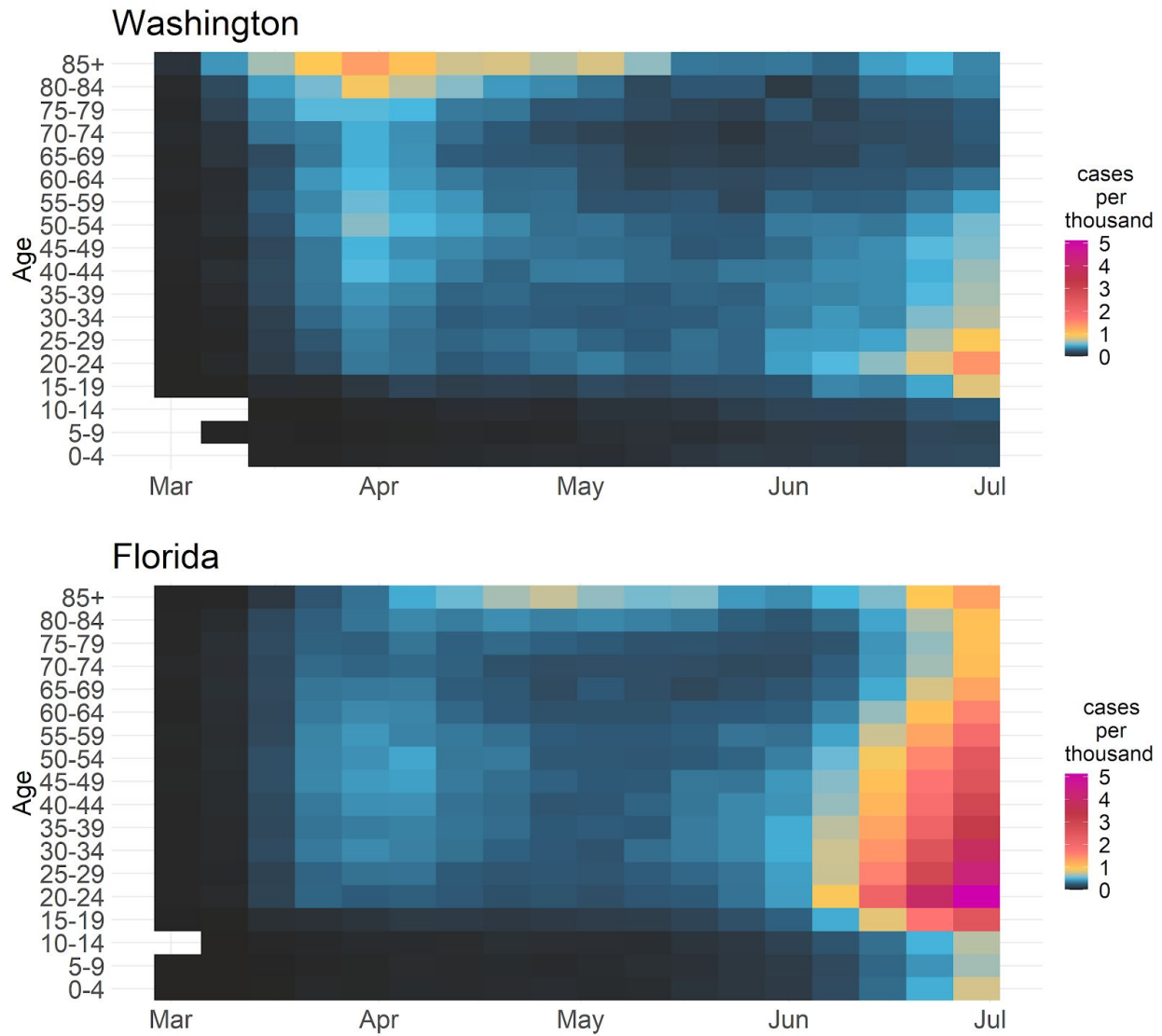


Figure 3: Cases per 1000 residents (2018 estimate) by age and week since the start of the COVID-19 epidemic in Washington (top) and Florida (bottom). In the first wave (which peaked in late March), cases were distributed across all adult ages. Through early June, the epidemic shifted younger (as described in more detail [here](#)). Since then, transmission across Washington State is surging fastest among 20-29 year olds and is spreading again into younger and older ages as we enter mid-July. The pattern in Washington mirrors that seen in Florida at a roughly 3 week delay. This is evidence that it is not possible to contain COVID-19 to a single stratum of society when prevalence is growing exponentially. (Florida [data publicly available from FDOH](#) and figures inspired by [Marc Bevand](#).)

In eastern WA, hospitalizations are trending upwards in all age groups. In western WA, the recent uptick is being led by hospitalizations among 20-39 year olds due to the large increase in disease among this group. Absent significant behavioral changes to regain control of COVID-19 transmission, continued growth in older and more vulnerable populations will lead to further strained capacity.

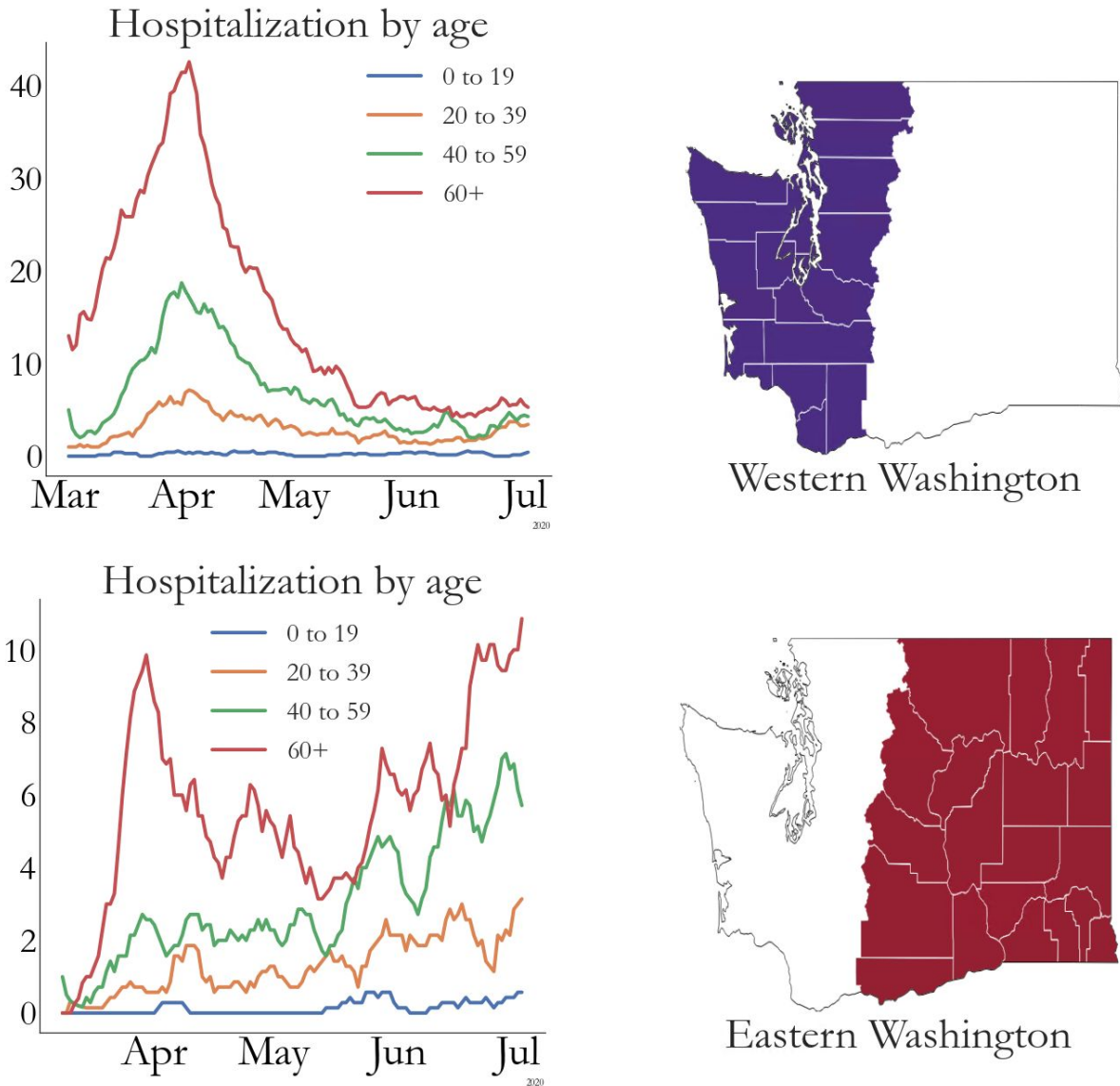


Figure 4: Hospitalizations by age group for 0-19 (blue), 20-39 (orange), 40-59, (green) and 60 and above (red) smoothed with a 7-day rolling average (curves) to highlight trends. Hospitalization rates are increasing across all ages with the recent growth of the epidemic. In addition to the direct consequences, a continued rise in western WA will strain sparse resources that have been available to support excess patients from Yakima.

Yakima and Spokane highlight two critical patterns in the current epidemic. With increased adherence to mask and distancing policies, the case count in Yakima continued its recent decline through July 2. In contrast, Spokane has been experiencing accelerating exponential growth in COVID-19 burden that has yet to show significant signs of slowing.

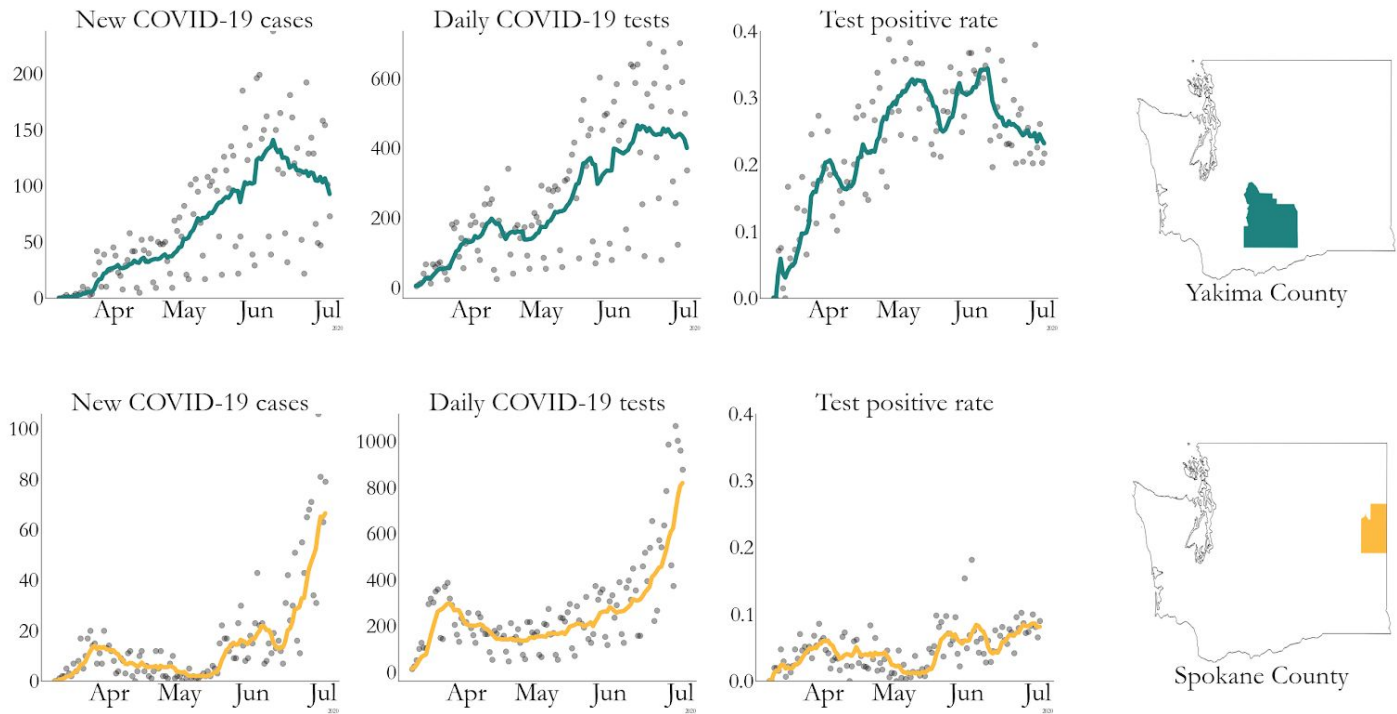


Figure 5: Case counts and test-positivity in Yakima (green) show continued progress toward gaining control of the COVID-19 epidemic for the first time in the region. In contrast, Spokane (yellow) avoided a large outbreak early but is now experiencing accelerated spread throughout the community as cases grow rapidly and test-positivity slowly climbs. The recent progress in Yakima highlights that [nearly universal public masking](#) is a critical part of regaining control of the epidemic, in addition to [physical distancing and limiting social contacts and gatherings](#).