SitRep 20: COVID-19 transmission across Washington State

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Results as of November 9th 2020.

We are publishing situation reports on a biweekly schedule on Wednesdays to better accommodate news cycles. If, on an off week, we identify a time-sensitive feature in the data, we will produce an updated report that week to ensure that changes in the situation are reported quickly. Because November 11 is Veteran's day we are publishing this report on November 10.

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 of current situation

Using data from the Washington Disease Reporting System (WDRS) through October 30, we estimate the effective reproductive number (R_e) in western Washington on October 24 was likely between 1.06 and 1.51, with a best estimate of 1.29. Meanwhile, we estimate that in eastern Washington, R_e was likely between 1.07 and 1.66 on October 24, with a best estimate of 1.36.

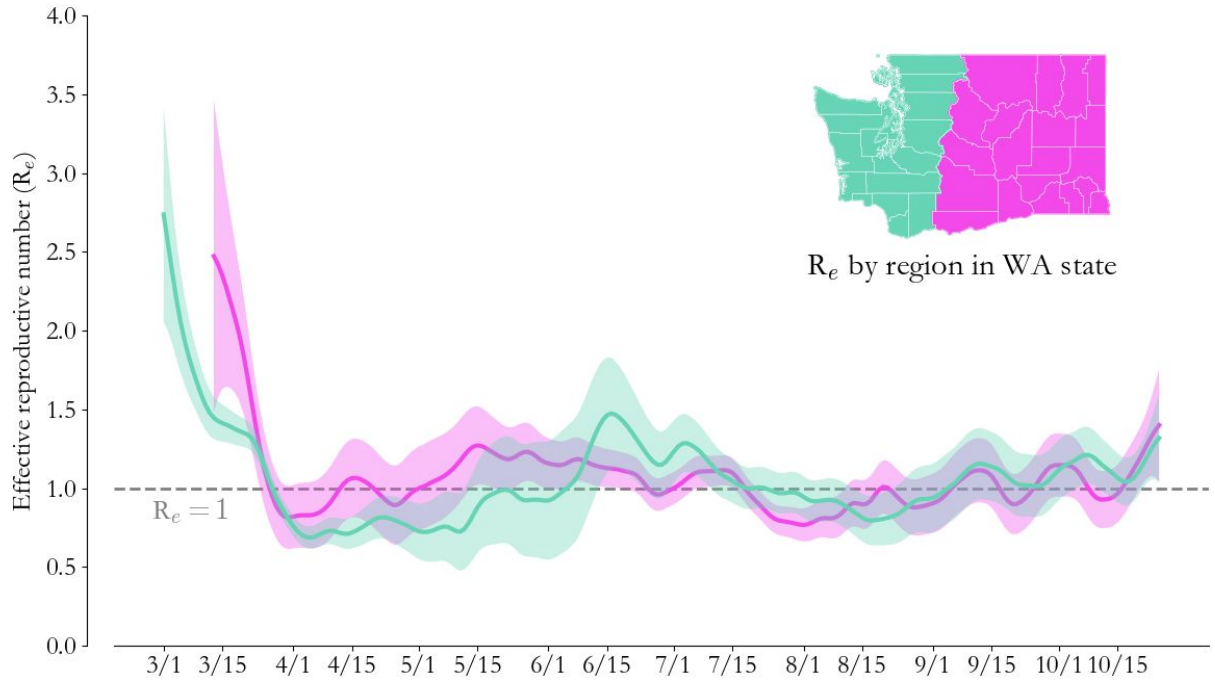

***Figure 1**: R_e estimates for eastern (pink) and western (green) WA, with 2 standard deviation error bars. Our most recent estimates suggest that R_e is, with high likelihood, above 1 in western WA since the start of October and that recent increases in cases and hospitalizations were driven by accelerating transmission. The R_e estimate for eastern Washington has fluctuated around 1 since the start of September, but the most recent estimates suggest there's a high likelihood it is now above 1.*

The seven-day moving average case count in eastern Washington has increased from 153 cases per day on September 13 to 267 on October 29. Hospital admissions in eastern Washington have been increasing since October 20, with a 7 day moving average of 14 admissions per day on October 29.

Case counts in western Washington have been steadily increasing since September 12, rising from a seven-day moving average of 196 cases per day on September 12 to 548 cases on October 29. This increase continues in the incomplete data subsequent to October 29. Hospital admissions in western Washington have been rising since the start of October, with a seven-day moving average of 27 admissions per day on October 29.

Although some of the growth in cases through early October is related to increased testing volumes, case counts in both eastern and western washington have increased over the two weeks ending October 29 despite testing volumes over that time period remaining flat.

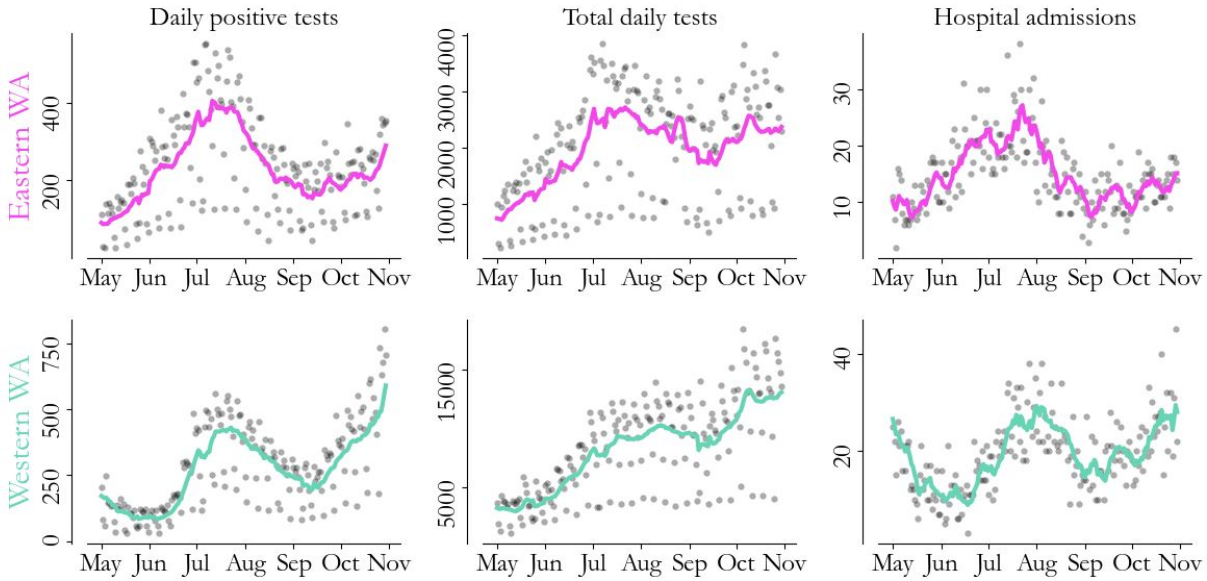

***Figure 2**: Seven-day rolling case counts (left panels), total tests (middle panels) and hospitalizations (right panels) for eastern Washington (top) and western Washington (bottom). Through October 29, recent daily case counts have increased across the state, rapidly in western Washington and at a slower rate in eastern Washington. Hospitalizations have increased in both regions.*

Details

Growth in cases has been widely distributed across Washington:

- Several larger counties (King, Pierce, Snohomish and Spokane) are seeing steady increases in case counts through October 29 that are continuing in the incomplete data.
- Benton, Clark, and Kitsap counties are moving from relatively steady counts in the complete data to steep increases in the incomplete data.
- Asotin, Skagit and Walla Walla counties continue to see clear increases in case counts in complete data continuing into the incomplete data. Walla Walla in particular is seeing steep increases in the incomplete data, with a seven day moving average of 29 cases per day on November 2.
- Several other small counties (Adams, Chelan, Cowlitz, Garfield and Lewis) are seeing increasing numbers of cases in the incomplete data, however absolute numbers of cases are still low.
- Thurston and Whatcom counties are seeing flat if somewhat fluctuating numbers of cases.
- Whitman county is seeing decreasing numbers of cases
- Franklin and Yakima counties are seeing gradually increasing numbers of cases.
- Other counties continue to have low numbers of cases.

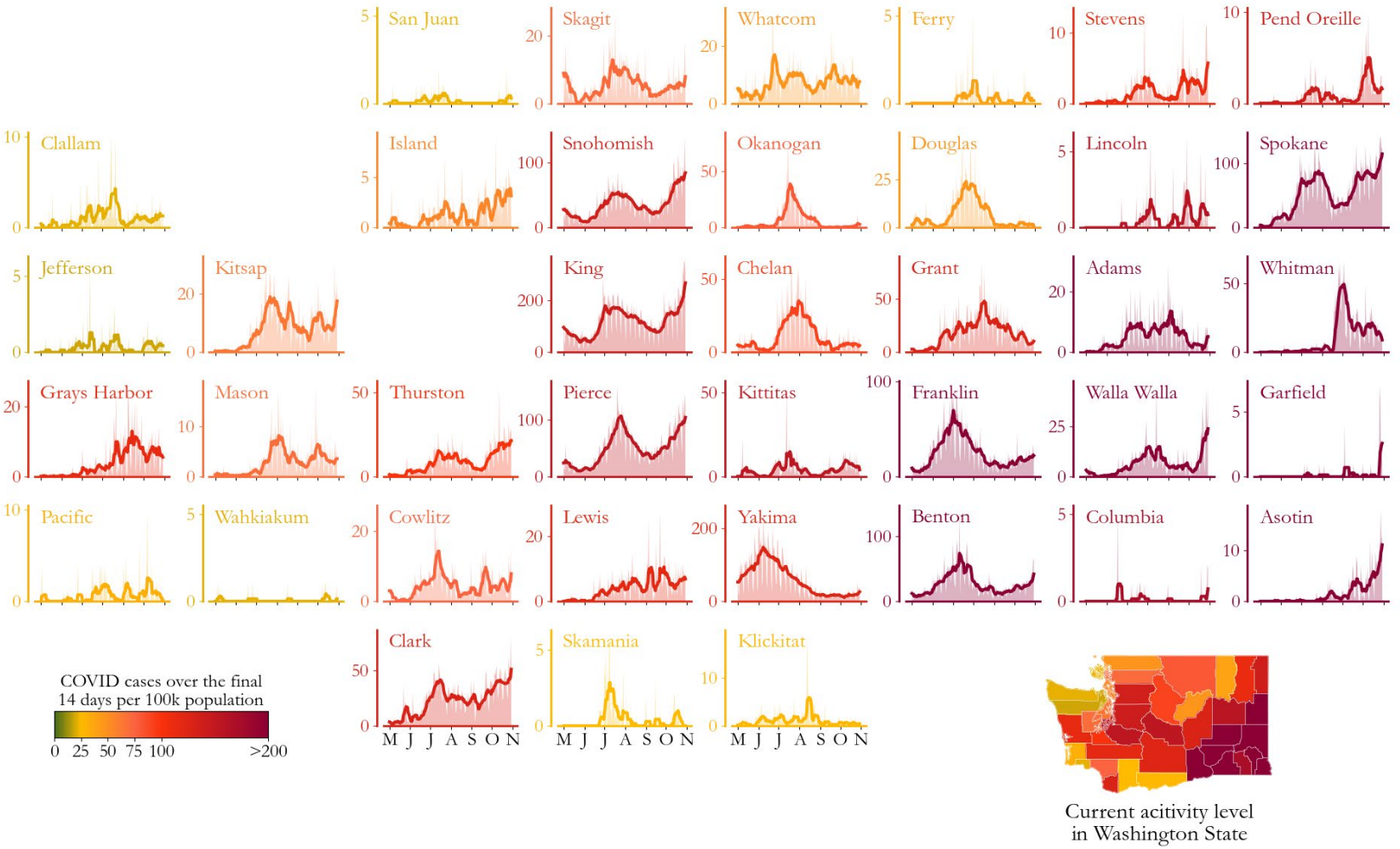

***Figure 3**: Daily COVID-19 positives (shaded areas) and 7-day moving averages (curves) arranged geographically and colored by COVID-19 activity level (total cases from October 17 to 30 per 100,000 people). Case trends across counties highlight geographic correlations and help us better understand region-level estimates of the transmission rate (see Figure 1). With R_e above 1 in both eastern and western WA, case counts are increasing in a number of counties across the state. Moreover, with sustained transmission throughout September and October, COVID-19 activity levels are generally high.*

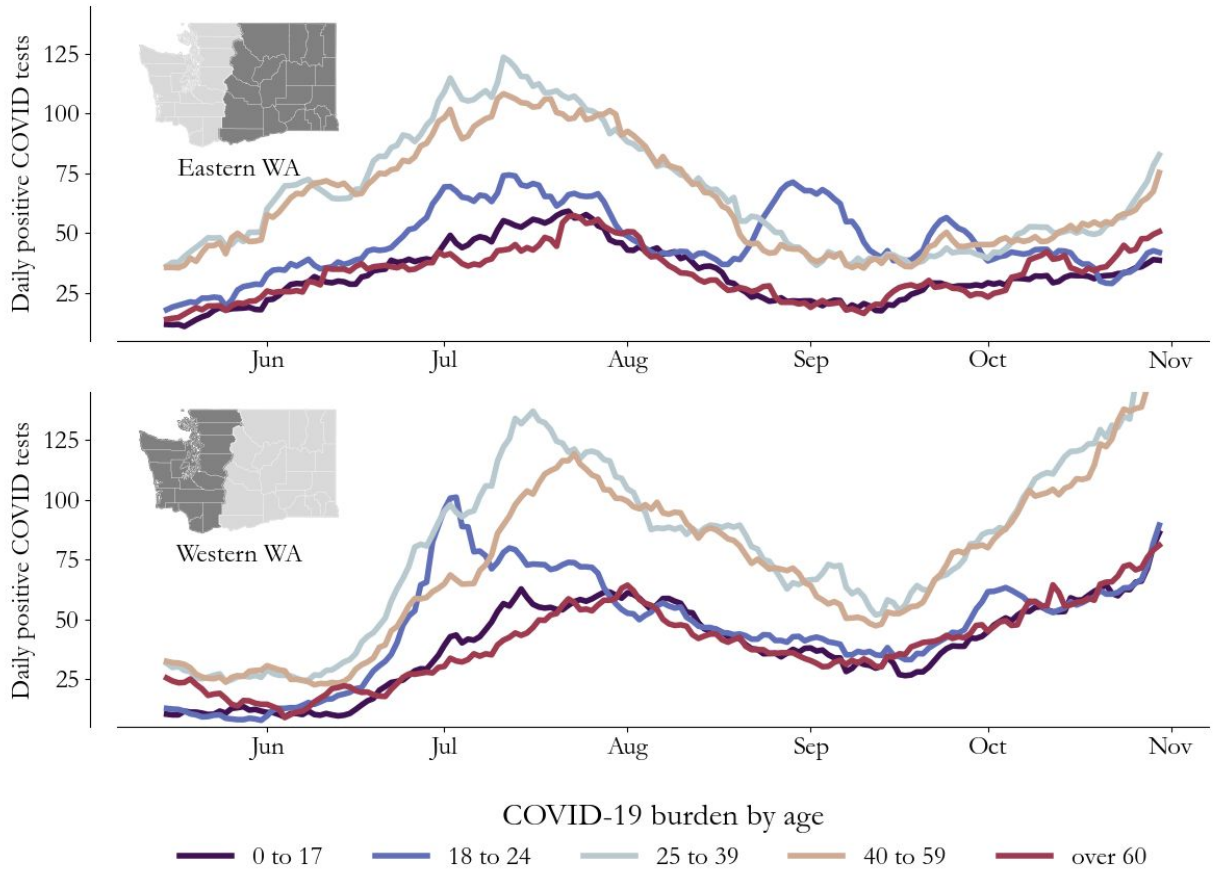

Figure 4. *Seven-day rolling average case counts by age group for eastern Washington (top) and western Washington (bottom) showing that increasing trends are widely distributed across age groups.*

In eastern Washington cases have been rising across most age groups, with the exception of the 18-24 age group. The overall rate of rise remains slower in eastern Washington, despite the considerably higher test positive and per capita rates compared to western Washington. On October 29, the seven-day test positive rate was 11.8% in eastern Washington and 4.3% in western Washington. Per capita rates at the same time were 206.8 and 118.8, respectively. The high test positive rate and higher per capita case rates, taken together with an Re estimate likely higher than one, indicate that the situation in eastern Washington remains precarious.

Increases in case counts in western Washington have been steepest in those aged 25-39 and 40-59 since mid-September with more recent steep increases in those aged 0-17 and 18-24. Thus, all age groups have sustained large increases since mid-September. Rising trends in older age groups (red lines in Figure 4) are particularly concerning, since the likelihood of severe outcomes grows significantly with age. Increases in infections in older age groups also have an outsized impact on hospital capacity as older adults are much more likely to be hospitalized and generally will have longer hospitalization stays than younger age groups.

Implications for public health practice

Although the daily numbers of confirmed cases in western Washington has now exceeded the peak number that was observed during the summer wave of cases, testing volumes are considerably higher (219.6 tests per week per 100,000 individuals as of October 29 compared to 137.1 on July 1). The rate of

increase in the test positive rate is slower than that which occurred from early June to early July, however recent estimates of R_e are approaching those seen during the same time period.

Of greater concern, daily hospitalizations in western Washington are at similar levels to those seen around the peak we saw over the summer (seven-day moving average of 27 cases on October 29 compared to 26 cases on August 1). Peak hospitalizations over summer occurred approximately two weeks after the peak in cases, suggesting that hospitalizations will continue to rise in western Washington even if cases start to plateau. Because patients may stay in the hospital for up to several weeks, hospital occupancy will continue to rise for some time after hospital admissions level off.

Although estimates for R_e have been lower in eastern Washington than western Washington since the start of October, the higher test positivity rates and per capita rates remain highly concerning. Also of concern are the much higher test positive rates and per capita rates across the border in Idaho, where test positive rates are approximately 50% higher than in eastern Washington, and per capita case rates are approximately 4 times higher.

The recent increase in cases is particularly concerning given that gatherings associated with the upcoming holiday season have the potential to result in additional substantial increases in transmission of COVID-19. The Canadian Thanksgiving (held October 12) resulted in increases in case counts in some areas of Canada, and we expect a similar increase could occur subsequent to the United States Thanksgiving unless we adapt our plans for the holidays accordingly, avoiding large and even modest-size gatherings, and not convening intergenerational celebrations that bring participants together from different locations where they may have unwittingly been exposed. There is a broad understanding that wearing masks while out in commercial or social situations is highly effective in preventing COVID transmission and it is important to increase the use of masks in these settings as much as possible. What is less well known is that mask use while socializing indoors even at home, and increasing ventilation will also help to prevent infections in small-group settings which have been identified as a major current source of community transmission. Avoiding gatherings entirely is recommended for individuals in categories at high risk for severe illness from COVID-19 infection, and if you decide to host or attend a gathering, reducing the size of the gathering and careful pre-planning of the event may help reduce the risk of spreading COVID-19.

Key inputs, assumptions, and limitations of the IDM modeling approach

We use a COVID-specific transmission model fit to testing and mortality data to estimate the effective reproductive number over time. 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 to estimating R_e and its assumptions and limitations, see the most recent technical report on the modeling methods. The estimates this week and going forward use the updated method in that report, which results in some statistically-insignificant retrospective changes to R_e relative to our previous 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, hospitalization, and death data compiled on November 8, and to hedge against delays in reporting, we analyze data as recent as October 30 across the state.** This relatively conservative hedge against lags is in response to reports of increasing test delays.
- 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.
- 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 are not addressed herein.

Collaboration notes

The Institute for Disease Modeling (IDM), Microsoft AI For Health, the University of Washington, and the Fred Hutchinson Cancer Research Center are working with WA DoH to provide support for 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. Modeling and analysis for the report are led by WA DoH and are based on models developed by IDM and advanced by Microsoft to better represent the state. 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 and to support WA DoH in its public health mission. This collaboration and its outputs will continue to evolve as scientific frontiers and policy needs change over time.