Washington State Department of Health

2019-nCoV Literature Situation Report (Lit Rep)
May 5, 2021

The scientific literature on COVID-19 is rapidly evolving and these articles were selected for review based on their relevance to Washington State decision making around COVID-19 response efforts. Included in these Lit Reps are some manuscripts that have been made available online as pre-prints but have not yet undergone peer review. Please be aware of this when reviewing articles included in the Lit Reps.

Key Takeaways

➢ **The proportions of persons infected with the SARS-CoV-2 B.1.526 variant (first identified in New York) who have poor clinical outcomes does not appear different from other circulating strains. Both breakthrough infections in fully vaccinated persons and possible reinfections were rare, but did not appear more common with the variant.** [More](#)

➢ **Results from six COVID-19 models accounting for increased transmission of the SARS-CoV-2 B.1.1.7 variant found that across 4 scenarios with varying levels of vaccination and non-pharmaceutical intervention (NPI) use, in the US cases would rise and peak through May 2021 and sharply decline by July 2021. High vaccination scenarios predicted a faster decline, and scenarios with moderate NPI use reduced cases and deaths regardless of vaccination levels. In scenarios with both low NPI use and low vaccination, some states were predicted to achieve case levels similar to late 2020.** [More](#)

➢ **More frequent introductions of the D614G variant combined with regional variation in the timing of reduced population mobility likely led to its rapid spread in Washington State, according to analysis of nearly 4000 viral sequences and mobility data between February and July 2020. The D614G variant was associated with higher viral load (as indicated by lower cycle threshold values) but not patient outcomes in the subset of patients where samples could be matched with clinical data.** [More](#)

Geographic Spread

- Analysis of 6,515 SARS-CoV-2 sequences sampled between January 2020 to March 2021 in Italy found that the previously dominant B.1.177 variant was replaced by the B.1.1.7 variant in January 2021. By the end of the sampling period, B.1.1.7 sequences comprised 34% of all sequences whereas B.1.177 comprised only 24%. Analysis of B.1.1.7 sequences indicated multiple introductions into Italy, and also identified numerous Italian-specific clades indicative of extended transmission chains. Notably the P.1 variant, first described in Brazil and first detected in Italy in January, was detected in increasing proportions.

  Di Giallonardo et al. (Apr 29, 2021). Emergence and Spread of SARS-CoV-2 Lineages B.1.1.7 and P.1 in Italy. Viruses. https://doi.org/10.3390/v13050794

- The rapid spread of the D614G variant in Washington State was a result of multiple introductions into areas with different levels of ongoing lockdown, according to a phylogenetic analysis of 3940 SARS-CoV-2 sequences from Washington State and county-level mobility data collected between February and July 2020. Sequences derived from out-of-state introductions were unevenly distributed, with D614G cases comprising a higher proportion of introductions. By the time statewide measures were implemented, decreased mobility (as assessed by Google workplace mobility data) in King County had coincided with decreased reproduction numbers for both D614G and 614D variants, while cases of D614G were more widespread in regions of the state where mobility was increased. Patients infected with D14G had significantly lower cycle threshold values (corresponding to higher viral load) on initial testing. A review of evidence from 248 clinical records did not suggest that D614G impacted disease severity or patient outcomes.

    Müller et al. (May 3, 2021). Viral Genomes Reveal Patterns of the SARS-CoV-2 Outbreak in Washington State. Science Translational Medicine.
    https://doi.org/10.1126/scitranslmed.abf0202

- The SARS-CoV-2 B.1.427/B.1.429 variant (aka CAL.20C), a variant of concern/interest (VOC/VOI) first described in California, was first detected in Colorado in late January 2021, and increased from 3-4% of all sequenced infections in late January to 20-22% in early March. Cases were dispersed across nearly half of counties. Among 60 cases who completed enhanced interviews, 9 reported travel outside of Colorado, 3 of which were to California. Based on available data, infection after vaccination occurred in 7 cases (2%).

    Martin Webb et al. (May 5, 2021). Identification of and Surveillance for the SARS-CoV-2 Variants B.1.427 and B.1.429 — Colorado, January–March 2021. MMWR. Morbidity and Mortality Weekly Report. https://doi.org/10.15585/mmwr.mm7019e2

Testing and Treatment

- In a study including 46 patients who received a positive PCR test either by nasopharyngeal swab (NPS) or saliva swab and had recovered from asymptomatic and mild SARS-CoV-2 infection, 42 (91%) tested positive for anti-SARS-CoV-2 spike antibodies after a median of 145 days of follow-up.

    Caulley et al. (May 4, 2021). Salivary Testing of COVID-19: Evaluation of Serological Testing Following Positive Salivary Results. BMC Infectious Diseases. https://doi.org/10.1186/s12879-021-06108-5

- A microfluidic nanoimmunoassay to detect anti-SARS-CoV-2 IgG antibodies achieved a sensitivity of 98% and specificity of 100% based on an analysis of 134 pre-pandemic sera and 155 sera from PCR-confirmed individuals. The assay relies on a repurposed blood from a glucose test strip (finger prick) and other low-cost blood sampling methods to eliminate the need for venipuncture, and is capable of analyzing up to 1,024 samples per device.

    Swank et al. (May 4, 2021). A High-Throughput Microfluidic Nanoimmunoassay for Detecting Anti–SARS-CoV-2 Antibodies in Serum or Ultralow-Volume Blood Samples. Proceedings of the National Academy of Sciences. https://doi.org/10.1073/pnas.2025289118

Vaccines and Immunity

- Among 23,176 patients with a positive SARS-CoV-2 in Utah between March and July 2020, 4 of 1,301 patients with at least one additional PCR test ≥60 days after the initial positive test were identified

to have probable reinfection and 6 additional patients had possible reinfection. Reinfection was assessed using combined clinical and RT-PCR cycle threshold data. Median time to recurrent positive RT-PCR was 85 days (IQR 74-107). Among the 4 probable reinfection cases, 3 required a higher level of medical care compared to their first infection.

> *Peltan et al. (May 4, 2021). Evaluation of Potential COVID-19 Recurrence in Patients with Late Repeat Positive SARS-CoV-2 Testing. PLOS ONE.* https://doi.org/10.1371/journal.pone.0251214

Clinical Characteristics and Health Care Setting

- *[Pre-print, not peer-reviewed]* In a systematic review and meta-analysis of neuropsychiatric symptoms in COVID-survivors (51 studies of 18,917 COVID-19 survivors), sleep disturbance was the most common neuropsychiatric symptom with a pooled prevalence of 27%, followed by fatigue (24%), objective cognitive impairment (also known as brain fog, 20%), anxiety (19%), and post-traumatic stress (16%). Mean duration of follow-up was 77 days after symptom onset. There was little to no evidence that symptom prevalence varied across hospitalization status, disease severity, or duration of follow-up.

  > *Badenoch et al. (May 4, 2021). Persistent Neuropsychiatric Symptoms after COVID-19 a Systematic Review and Meta-Analysis. Pre-print downloaded May 5 from* https://www.medrxiv.org/content/10.1101/2021.04.30.21256413v1

- In a study including 3,028 patients in Europe with immune-mediated inflammatory disease, symptomatic COVID-19 occurred in 4% (n=122) and anti-SARS-CoV-2 antibodies were detected in 5% (n=166) of patients between June and December 2020. Symptomatic COVID-19 was associated with higher concentrations of C-reactive protein (OR=1.2) and higher numbers of disease flares (OR=1.3).

  > *Saadoun et al. (Apr 2021). SARS-CoV-2 Outbreak in Immune-Mediated Inflammatory Diseases: The Euro-COVIMID Multicentre Cross-Sectional Study. The Lancet Rheumatology.* https://doi.org/10.1016/S2665-9913(21)00112-0

- The SARS-CoV-2 B.1.526 variant, a variant of concern/interest (VOC/VOI) first described in New York City (NYC), does not appear to lead to more severe disease, increased risk of infection after vaccination, or increased risk of reinfection according to preliminary analyses of infections with sequenced virus matched to epidemiologic characteristics in NYC from January to April 2021 (n=9,765). Among individuals infected with the B.1.526 variant, 71% were symptomatic, 4% were hospitalized, and 0.5% died; these frequencies were similar or lower than among individuals infected with non-VOC/VOI infections. Prevalence of possible reinfections was similar across all sequenced specimens and was rare (0.5%). However, previous positivity for anti-SARS-CoV-2 spike antibodies was slightly more common among persons infected with the B.1.526 variant carrying the E484K mutation. Among 32 fully vaccinated persons with sequenced viruses, eight (25%) were infected with the B.1.526 variant carrying the E484K mutation, three (9%) with the B.1.526 variant without the E484K mutation, seven (22%) with the B.1.1.7 variant, and 14 (44%) with non-VOI/VOC infections.
- B.1526 infections (n=3,679 total) comprised 3% of all sequenced infections in mid-January, 34% by late February, and stabilized to 35-45% beginning in March. The proportion of B.1.526 infections with the E484K mutation increased more quickly, and by the end of the study comprised 25% of all sequenced infections and more than half (56%) of all B.1.526 infections.

Thompson et al. (May 5, 2021). Rapid Emergence and Epidemiologic Characteristics of the SARS-CoV-2 B.1.526 Variant — New York City, New York, January 1–April 5, 2021. MMWR. Morbidity and Mortality Weekly Report. https://doi.org/10.15585/mmwr.mm7019e1

Modeling and Prediction

- A model assessing the impact of contact tracing on epidemic size reduction suggests that for manual contact tracing, as the fraction of contacts correctly recalled increases there are linear reductions in epidemic size while reductions were quadratically reduced with digital contact tracing via apps, as both case and contact need to be running the app. The benefit-to-cost ratio, as measured by the epidemic size reduction to number of quarantine ratio, of both contact tracing techniques are higher when the reproductive number is smaller.

    Barrat et al. (May 5, 2021). Effect of Manual and Digital Contact Tracing on COVID-19 Outbreaks: A Study on Empirical Contact Data. Journal of The Royal Society Interface. https://doi.org/10.1098/rsif.2020.1000

- Data from six models forecasting US COVID-19 projections with the 50% more transmissible B.1.1.7 variant up to September 2021 found that across 4 scenarios with varying levels of vaccination and non-pharmaceutical intervention (NPI) use, cases would rise and peak through May 2021 and sharply decline by July 2021. High vaccination scenarios predicted a faster decline. Scenarios with moderate NPI use reduced cases and deaths regardless of vaccination levels, with larger effects under low vaccination scenarios. The largest differences among scenarios was in the cumulative excess percentage of hospitalizations. Differences in deaths were lower because many of the groups at highest risk were already vaccinated prior to the projection window. Low NPI use and low vaccination scenarios consistently predicted the largest excess percentages in estimated effects across models, suggesting that some states could reach levels of disease similar to those observedin late 2020.

    Borchering et al. (May 5, 2021). Modeling of Future COVID-19 Cases, Hospitalizations, and Deaths, by Vaccination Rates and Nonpharmaceutical Intervention Scenarios — United States, April–September 2021. MMWR. Morbidity and Mortality Weekly Report. https://doi.org/10.15585/mmwr.mm7019e3

Other Resources and Commentaries

- Can the Covid-19 Natural Experiment Teach Us About Care Value and System Preferences? –NEJM (May 5)
- Impact of Disasters, Including Pandemics, on Cardiometabolic Outcomes across the Life-Course: A Systematic Review – BMJ Open (May 3)
- Human Kidney Is a Target for Novel Severe Acute Respiratory Syndrome Coronavirus 2 Infection – Nature Communications (Dec 4)
- Assessing the Long-Term Safety and Efficacy of COVID-19 Vaccines – Journal of the Royal Society of Medicine (May 4)
- Relative Infectiousness of Asymptomatic SARS-CoV-2 Infected Persons Compared with Symptomatic Individuals: A Rapid Scoping Review – BMJ Open (May 4)
- Saliva and Its Potential in Covid-19 Cannot Be Ignored: A Point of View – Infection Control and Hospital Epidemiology (May)

- [Resilience Testing of Health Systems: How Can It Be Done](#) – International Journal of Environmental Research and Public Health (Apr 29)
- [Mass Testing - an Underexplored Strategy for COVID-19 Control](#) – The Innovation (Apr)
- [The effectiveness of national-level containment and closure policies across income levels during the COVID-19 pandemic: an analysis of 113 countries](#) – Health Policy and Planning (Apr 29)
- [CMA Urges National Action to Curb Third Wave of COVID-19](#) – Canadian Medical Association Journal (May 3)
- [Immune-Mediated Disease Flares or New-Onset Disease in 27 Subjects Following MRNA/DNA SARS-CoV-2 Vaccination](#) – Vaccines (Apr 29)

Report prepared by the UW Alliance for Pandemic Preparedness and Global Health Security and the START Center in collaboration with and on behalf of WA DOH COVID-19 Incident Management Team