



## 2019-nCoV Literature Situation Report (Lit Rep)

October 12, 2020

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

- **More than 815,000 deaths due to COVID-19 globally could be prevented by universal mask use between August 26, 2020 and January 1, 2021, based on recent IHME projections.** [More](#)
- **In a study of convalescent plasma for the treatment of severe COVID-19, there was no overall significant reduction of in-hospital mortality or increased rate of hospital discharge associated with the use of the treatment, although there was some evidence for improved outcomes among older patients.** [More](#)
- **Point-of-care SARS-CoV-2 testing was associated with large reductions in time to results compared with centralized laboratory PCR testing, which might improve infection control measures.** [More](#)
- **Mathematical modeling indicates that schools using a "Five-Day Switch" plan, which divides students into two cohorts, each of whom attend class in person for five consecutive days followed by distance learning for five days, would maximize the protection of both students and the community while gaining the benefits of in-person learning.** [More](#)

### Non-Pharmaceutical Interventions

- *[Pre-print, not peer reviewed]* An IHME analysis found that universal mask use could lead to a reduction of 815,600 (95% UI 430,600 – 1,491,000) deaths from COVID-19 globally between August 26th 2020 and January 1st 2021. The analysis used meta-regression of 40 studies measuring the impact of mask use on respiratory viral infections, as well as a transmission dynamics model together with data from online surveys about the proportion of people reporting always wearing a mask outside their home. An estimated 59% of people globally used masks on August 18th, and the potential effects of universal mask use were greatest in countries such as India (158,832 fewer deaths), the United States of America (93,495 fewer deaths), and Russia (68,531 fewer deaths).  
Gakidou et al. (Oct 11, 2020). Global Projections of Potential Lives Saved from COVID-19 through Universal Mask Use. Pre-print downloaded Oct 12  
<https://doi.org/10.1101/2020.10.08.20209510>

### Transmission

- A study of SARS-CoV-2 contamination of environmental surfaces and air found that SARS-CoV-2 may be present on environmental surfaces for several days, especially in bathrooms. 641 specimens were collected from homes, hotels, public areas, cars, and pets that were potentially in contact with 39 individuals positive for SARS-CoV-2 in China. All positive specimens, based on RT-PCR testing, were collected within 3 days of diagnosis. Air specimens collected in rooms and cars were all



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negative, while 20 environmental specimens were found to be positive throughout the home, 10 of which were from the bathroom.

Luo et al. (Oct 9, 2020). *Air and Surface Contamination in Non-Health Care Settings among 641 Environmental Specimens of 39 COVID-19 Cases*. *PLOS Neglected Tropical Diseases*.

<https://doi.org/10.1371/journal.pntd.0008570>

## Testing and Treatment

- [Pre-print, not peer reviewed] A systematic review and meta-analysis of the diagnostic accuracy of seven different FDA-authorized tests for SARS-CoV-2 antibodies found that the pooled sensitivity was 87% and the pooled specificity was nearly 100%. Sensitivity increased with increased time between symptom onset and sample collection: at  $\leq 7$  days, sensitivity was 44%, for 8-14 days, sensitivity was 84%, and for blood draws  $\geq 15$  days after the onset of symptoms, sensitivity was 96%. The study found considerable heterogeneity between the tests and concluded that FDA authorized serology tests show high diagnostic accuracy for SARS-CoV-2 infection if performed under similar conditions.

Pandey et al. (Oct 11, 2020). *Diagnostic Accuracy of FDA Authorized Serology Tests to Detect SARS-CoV-2 Antibodies A Systematic Review and Meta-Analysis*. Pre-print downloaded Oct 12

<https://doi.org/10.1101/2020.10.07.20208553>

- Sample pooling was found to be a practical strategy for SARS-CoV-2 testing in low-prevalence settings. The study assessed the sensitivity and theoretical efficiency of two, four, and eight-sample pools to evaluate throughput and assess the potential to conserve PCR reagents. As pool size increased, sensitivity decreased and efficiency increased. The practicality of pooling samples also diminished in settings with high SARS-CoV-2 prevalence. The authors note that such a strategy may be best applied for testing asymptomatic individuals in the general population, who have a low pre-test probability.
- An observational retrospective analysis of the characteristics and risk factors for mortality in patients with severe COVID-19 treated with the immunomodulator tocilizumab (TCZ), with or without corticosteroids, found that mortality was associated with older age (HR=1.09), chronic heart failure (HR=4.4), and chronic liver disease (HR=4.69). 186 patients were treated with TCZ, among whom 129 were also treated with corticosteroids. Of the total 186 patients, 155 patients were receiving non-invasive ventilation when TCZ, with or without corticosteroids, was initiated. The use of corticosteroids in combination with TCZ was the main protective factor against mortality (HR=0.26) in patients with severe COVID-19 who received TCZ. In addition, no serious superinfections were observed at 30-days of follow-up.

Chong et al. (Sept 22, 2020). *Sample Pooling Is a Viable Strategy for SARS-CoV-2 Detection in Low-Prevalence Settings*. *Pathology*. <https://doi.org/10.1016/j.pathol.2020.09.005>

Rubio-Rivas et al. (Oct 1, 2020). *Beneficial Effect of Corticosteroids in Preventing Mortality in Patients Receiving Tocilizumab to Treat Severe COVID-19 Illness*. *International Journal of Infectious Diseases*. <https://doi.org/10.1016/j.ijid.2020.09.1486>

- A study of the efficacy of convalescent plasma for the treatment of severe COVID-19 showed that although there was some evidence for improved outcomes among older patients, there was no overall significant reduction of in-hospital mortality or increased rate of hospital discharge associated with the use of convalescent plasma. Transfusion reactions were observed in 2.8% of participants who received convalescent plasma treatment, which was greater than expected. The

authors highlight the need for future randomized studies with greater power to characterize effects among older adults in order to assess the efficacy of convalescent plasma treatment.

*Rogers et al. (Oct 10, 2020). Convalescent Plasma for Patients with Severe COVID-19: A Matched Cohort Study. Clinical Infectious Diseases. <https://doi.org/10.1093/cid/ciaa1548>*

### Clinical Characteristics and Health Care Setting

- Point-of-care testing for SARS-CoV-2 was associated with large reductions in time to results compared with centralized laboratory PCR testing in a prospective, interventional, non-randomized study of molecular point-of-care testing in the UK. 39% of adult patients in the point-of-care testing group and 28% in the control group tested positive for SARS-CoV-2 infection using nose and throat swabs. A Cox proportional hazards regression model controlling for age, sex, time of presentation, and severity of illness showed that time to results was significantly shorter in the point-of-care testing group than in the control group. The authors suggest that this decreased time to results could improve infection control measures and patient flow.

*Brendish et al. (Oct 8, 2020). Clinical Impact of Molecular Point-of-Care Testing for Suspected COVID-19 in Hospital (COV-19POC): A Prospective, Interventional, Non-Randomised, Controlled Study. The Lancet Respiratory Medicine. [https://doi.org/10.1016/S2213-2600\(20\)30454-9](https://doi.org/10.1016/S2213-2600(20)30454-9)*

- *[Pre-print, not peer reviewed]* A cross-sectional study to determine the prevalence and longevity of SARS-CoV-2 antibodies in healthcare workers and first responders in California showed that antibody prevalence was 0.9% at the start of the study and 2.6% at 8-week follow-up among healthcare workers, and 5.3% and 4.4%, respectively, among first responders (between May and August, 2020). For healthcare workers, significant differences in test results at initial assessment were found based on age, race, fever, and loss of smell, and at 8-week follow-up for age, race, and all symptoms. Antibody positivity lasted for at least 8 weeks. Among 75 healthcare workers with self-reported prior PCR-confirmed COVID-19, 35 (46.7%) were antibody negative. The authors note the SARS-CoV-2 antibody prevalence among healthcare workers was much lower compared to other studies, which may be explained by factors such as occupational safety measures, enhanced awareness surrounding COVID-19, or low COVID-19 prevalence in the community.

*Brant-Zawadzki et al. (Oct 11, 2020). Prevalence and Longevity of SARS-CoV-2 Antibodies in Healthcare Workers A Single Center Study. Pre-print downloaded Oct 12 <https://doi.org/10.1101/2020.10.09.20210229>*

### Modeling and Prediction

- *[Pre-print, not peer reviewed]* Results from one modelling study suggest that a Sampling-Testing-Quarantine strategy for identifying and isolating asymptomatic individuals with COVID-19 may help slow the spread of the epidemic without school or work shutdowns. An agent-based model was designed to simulate the COVID-19 epidemic in Seattle, in order to test the strategy. The strategy involves using probability sampling from the general population and identifying and isolating individuals who test positive, along with members of their household who have a high probability of developing an asymptomatic infection.

*Williams et al. (Oct 12, 2020). An Innovative Non-Pharmaceutical Intervention to Mitigate SARS-CoV2 Spread Probability Sampling to Identify and Isolate Asymptomatic Cases. Pre-print downloaded Oct 12 <https://doi.org/10.1101/2020.10.07.20208686>*

- *[Pre-print, not peer reviewed]* An age-structured mathematical model investigating age-specific allocation strategies for SARS-CoV-2 vaccines indicated that across 179 countries, the highest priority individuals for vaccination were typically those 30-59 years of age, based on their higher risk of infection and disease, and greater rates of contact. The model assumed that the vaccine would be

70% effective, and that there was age-dependent susceptibility and disease severity. The authors estimate that optimizing how the COVID-19 vaccine is allocated can more than double its impact in reducing SARS-CoV-2 transmission for a fixed number of doses.

Meehan et al. (Oct 11, 2020). *Age-Targeted Dose Allocation Can Halve COVID-19 Vaccine Requirements*. Pre-print downloaded Oct 12 <https://doi.org/10.1101/2020.10.08.20208108>

- [Pre-print, not peer reviewed] A modeling study of different school reopening plans indicated that plans that provide for multiple days in school in a row and divide students into smaller cohorts, as well as those that emphasize distance learning, are better able to suppress outbreaks and reduce risk if an individual with COVID-19 enters the community. Such plans were found to be protective for both the students and surrounding community by separating the larger population into smaller intermixing subpopulations. The authors state that the "Five-Day Switch" plan, which divides students into two cohorts, each of whom attend class in person for five consecutive days followed by distance learning for five days, best captures these protective attributes.

Shelley et al. (Oct 12, 2020). *Safely Reopening K-12 Schools During the COVID-19 Pandemic*. Pre-print downloaded Oct 12 <https://doi.org/10.1101/2020.10.07.20208710>

## Public Health Policy and Practice

- Deaths from all causes in the US increased by 20% above the number expected between March 1 and August 1, 2020. An estimated 150,541 of these excess deaths (67%) were attributed to COVID-19. The 10 states with the highest per capita level of excess deaths were New York, New Jersey, Massachusetts, Louisiana, Arizona, Mississippi, Maryland, Delaware, Rhode Island, and Michigan. The analysis used data from the National Center for Health Statistics and US Census Bureau.

Woolf et al. (Oct 12, 2020). *Excess Deaths From COVID-19 and Other Causes, March-July 2020*. JAMA. <https://doi.org/10.1001/jama.2020.19545>

- The cumulative COVID-19 mortality in the US through September 19, 2020 of 60.3 per 100,000 people is comparable to other high-mortality countries like Spain (65 per 100,000), the UK (62.6 per 100,000) and Italy (59.1 per 100,000). However, the COVID-19 mortality in the US has remained high in the past four months, while the other high-mortality countries had higher levels than the US early in the epidemic and have fallen below the US in recent months. The authors note that these rates are not adjusted for differences in patterns of age or comorbidities across populations.

Bilinski and Emanuel. (Oct 12, 2020). *COVID-19 and Excess All-Cause Mortality in the US and 18 Comparison Countries*. JAMA. <https://doi.org/10.1001/jama.2020.20717>

- The cumulative incidence of COVID-19 was reported to be three-fold higher among Black individuals in the US compared to white individuals, and the crude mortality was two-fold higher. However, the infection-fatality-ratio was similar between Black and white individuals. There was a higher prevalence of comorbidities (63% vs 55%) and adverse socioeconomic factors (47% vs 31%) for Black individuals compared to white individuals. The prevalence of preexisting medical conditions was similar among both groups, while the prevalence of poor health behaviors was higher in white individuals (57% vs. 50%). Within racial groups, the geographic distribution of health determinants did not correlate with state-level COVID-19 mortality and infection-fatality ratio.

Parcha et al. (Oct 2020). *Geographic Variation of Racial Disparities in Health and COVID-19 Mortality*. *Mayo Clinic Proceedings: Innovations, Quality & Outcomes*. <https://doi.org/10.1016/j.mayocpiqo.2020.09.005>

## Other Resources and Commentaries

- [The intersection of COVID-19 and mental health](#) – The Lancet (Oct 2020)
- [SARS-CoV-2 pharmacologic therapies and their safety/effectiveness according to level of evidence](#) – The American Journal of Emergency Medicine (Sept 2020)
- [Is recurrence possible in coronavirus disease 2019 \(COVID-19\)? Case series and systematic review of literature](#) - European Journal of Clinical Microbiology & Infectious Diseases (Oct 2020)
- [The changing demographics of COVID-19](#) – The Lancet Respiratory Medicine (Oct 2020)
- [Re-infection with SARS-CoV-2: What Goes Around May Come Back Around](#) – Clinical Infectious Diseases (Oct 2020)
- [Media trust and infection mitigating behaviours during the COVID-19 pandemic in the USA](#) – BMJ Global Health (Oct 2020)
- [COVID-19 Testing and Infection Surveillance: Is a Combined Digital Contact Tracing and Mass Testing Solution Feasible in the United States?](#) – Cardiovascular Digital Health Journal (Oct 2020)
- [Seasonality of Respiratory Viral Infections: Will COVID-19 Follow Suit?](#) – Frontiers in Public Health (Sept 2020)
- [2.5 million more child marriages due to COVID-19](#) pandemic – The Lancet (Oct 2020)

*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*