



2019-nCoV Literature Situation Report (Lit Rep)

June 2, 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

- **A discrete-choice experiment focusing on COVID-19 risk and the tradeoffs inherent in mitigation strategies reveals that US adults fall into four distinct categories predicted by political affiliation, race, household income and employment status.**
- **Analysis of an online survey shows that COVID-19 risk perception and trust in science are both independent predictors of compliance with COVID-19 prevention guidelines.**
- **Cats and dogs both develop a neutralizing antibody response to SARS-CoV-2. While cats exhibited viral shedding, dogs were not found to shed the virus after infection.**
- **A small study of postpartum women did not find the presence of SARS-CoV-2 in breast milk, providing some indication that breast milk may not substantially contribute to mother-to-child transmission.**

Non-Pharmaceutical Interventions

- A systematic review and meta-analysis of non-pharmacological interventions to prevent transmission of betacoronaviruses such as SARS-CoV-2 reveal that physical distancing by at least 1 meter had lower viral transmission, with protection increasing at longer distances. Face masks also showed a large reduction in infection risk, with stronger associations for N95 or similar respirators as compared to disposable surgical masks or cotton masks.
Chu et al. (June 1, 2020). Physical Distancing, Face Masks, and Eye Protection to Prevent Person-to-Person Transmission of SARS-CoV-2 and COVID-19: A Systematic Review and Meta-Analysis. The Lancet. [https://doi.org/10.1016/S0140-6736\(20\)31142-9](https://doi.org/10.1016/S0140-6736(20)31142-9)
- Structural equation modeling on a dataset from an online survey (n=525) shows that COVID-19 risk perception and trust in science are both independent predictors of compliance with COVID-19 prevention guidelines, while other factors such as political conservatism and religious orthodoxy indirectly affect compliance through trust in science.
Plohl and Musil. (June 1, 2020). Modeling Compliance with COVID-19 Prevention Guidelines: The Critical Role of Trust in Science. Psychology, Health & Medicine. <https://doi.org/10.1080/13548506.2020.1772988>
- *[pre-print, not peer reviewed]* A US-based discrete-choice experiment focusing on COVID-19 risk, duration of social distancing measures, and depth and duration of negative economic impacts reveal that respondents (n=5,953) fell into 4 distinct groups: 1) risk minimizers (36%), who prioritized



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minimizing risk of COVID-19; 2) waiters (26%), who placed little importance on COVID-19 risk but preferred to delay reopening of businesses; 3) pro-business (25%), who prioritize economic recovery more than mitigating COVID-19 risk; and 4) openers (13%), who prefer to reopen businesses immediately.

- Political affiliation, race, household income and employment status were associated with group membership, although the authors find that Democrats and Republicans are more similar than those who identify as independent.

Reed et al. (June 2, 2020). Willingness to Accept Tradeoffs among Covid-19 Cases Social-Distancing Restrictions and Economic Impact A Nationwide US Study. Preprint downloaded June 2 from <https://doi.org/10.1101/2020.06.01.20119180>

- Sharfstein et al. argue that reopening of schools in autumn 2020 is an urgent national priority because of loss of access to meals and health services, disparities in internet access, and impacts on academic growth.
- The authors recommend establishing robust testing, contact tracing and isolation protocols, limiting close contact activities, prioritizing high-risk children, and preparing a strong public health and environmental response. They emphasize that school systems should be flexible to the needs of high-risk students and teachers.

Sharfstein and Morphew. (June 1, 2020). The Urgency and Challenge of Opening K-12 Schools in the Fall of 2020. JAMA. <https://doi.org/10.1001/jama.2020.10175>

Transmission

- *[pre-print, not peer reviewed]* Bosco-Lauth et al. showed that cats are susceptible to subclinical infection with SARS-CoV-2, capable of direct transmission to other cats, have prolonged viral shedding for up to 5 days, and develop a neutralizing antibody response that prevents reinfection. Dogs also developed an antibody response but were found to not shed the virus after infection. None of the animals exhibited any clinical signs of disease during the study.
- The authors conclude that these results suggest that it is unlikely that domestic pets can be a significant source of infection, and that neutralizing antibody titers may have implications for vaccine development for humans.

Bosco-Lauth et al. (June 1, 2020). Pathogenesis Transmission and Response to Re-Exposure of SARS-CoV-2 in Domestic Cats. Preprint downloaded June 2 from <https://doi.org/10.1101/2020.05.28.120998>

- *[pre-print, not peer reviewed]* Buonanno et al. present a 4-step approach for quantitatively assessing infection risk in the presence of an asymptomatic COVID-19 subject in naturally-ventilated indoor environments, asserting that exposure time should be no longer than 20 minutes to limit the individual risk of infection to no more than 1%. After retrospectively assessing prior outbreaks such as in a restaurant in Guangzhou, China, and a choir rehearsal in Mount Vernon, WA, the authors claim that outbreaks can only be explained by airborne transmission as the primary route of infection.

Buonanno et al. (June 2, 2020). Quantitative Assessment of the Risk of Airborne Transmission of SARS-CoV-2 Infection Prospective and Retrospective Applications. Preprint downloaded June 2 from <https://doi.org/10.1101/2020.06.01.20118984>

- *[pre-print, not peer reviewed]* A small study (n=23) of postpartum women with confirmed or suspected COVID-19 did not find SARS-CoV-2 in any breast milk samples. Presence of IgM in breast

milk correlated with detection in maternal blood. IgG for SARS-CoV-2 was not found in any breast milk samples. Of the 8 infants that were tested one month after birth, all results were negative for SARS-CoV-2. These findings suggest that breast milk may not be a common vector for SARS-CoV-2.

Luo et al. (June 1, 2020). Safety of Breastfeeding in Mothers with SARS-CoV-2 Infection. Preprint downloaded June 2 from <https://doi.org/10.1101/2020.05.30.20033407>

Testing and Treatment

- *[pre-print, not peer reviewed]* Muhovic et al. present a case of probable drug-induced liver injury in a patient with severe COVID-19 who received tocilizumab. One day after receiving the drug, which functions as an inhibitor of interleukin-6, acute liver injury was verified in laboratory analyses. Biopsy to diagnose drug-induced liver injury was not performed due to the patient's fragile condition. The authors suggest the need to liver function monitoring among COVID-19 patients receiving potentially hepatotoxic drugs.

Muhović et al. (May 17, 2020). First Case of Drug-induced Liver Injury Associated with the Use of Tocilizumab in a Patient with COVID-19. Liver International. <https://doi.org/10.1111/liv.14516>

Clinical Characteristics and Health Care Setting

- *[pre-print, not peer reviewed]* By inducing infection in cardiac tissue models and living human heart slices, Bojkova et al. demonstrate that cardiomyocytes (heart cells) can be directly infected with SARS-CoV-2. This study may provide evidence to explain the association between elevated markers of cardiac injury with higher risk of mortality in COVID-19 patients.

Bojkova et al. (June 1, 2020). SARS-CoV-2 Infects and Induces Cytotoxic Effects in Human Cardiomyocytes. Preprint downloaded June 2 from <https://doi.org/10.1101/2020.06.01.127605>

- Han et al. found that levels of cytokines and C-reactive protein were higher in serum samples from COVID-19 patients (n=102) than control samples from healthy volunteers (n=45). Within COVID-19 patients, IL-6 and IL-10 levels were significantly higher in the critical group, indicating that higher levels of cytokine storm are associated with more severe disease development.

Han et al. (May 31, 2020). Profiling Serum Cytokines in COVID-19 Patients Reveals IL-6 and IL-10 Are Disease Severity Predictors. Emerging Microbes & Infections. <https://doi.org/10.1080/22221751.2020.1770129>

- *[pre-print, not peer reviewed]* Xiong et al. surveyed 797 asymptomatic healthcare workers with intensive exposure to COVID-19 patients in Wuhan, China and found that positive IgG was detected in 35, leading to a seroprevalence of 4.4%.

Xiong et al. (June 2, 2020). The Prevalence of Antibodies to SARS-CoV-2 in Asymptomatic Healthcare Workers with Intensive Exposure to COVID-19. Preprint downloaded June 2 from <https://doi.org/10.1101/2020.05.28.20110767>

- *[pre-print, not peer reviewed]* An observational study of COVID-19 pediatric patients (n=35) in Southern California showed diverse clinical presentations, with greater disease severity was associated with higher viral load and younger age. The authors found no correlation between disease severity and viral genetic variations.

Pandey et al. (June 1, 2020). Pediatric COVID-19 in Southern California Clinical Features and Viral Genetic Diversity. Preprint downloaded June 2 from <https://doi.org/10.1101/2020.05.28.20104539>

Modeling and Prediction

- *[pre-print, not peer reviewed]* Martin et al. modeled transmission on a university campus and conclude that a testing frequency of 100% of a campus population per month is required to detect an outbreak when there are fewer than 9 detectable infections. A greater numbers of symptomatic people reporting to health services for testing could help compensate for lower levels of testing. Adding a 10% pre-existing immunity to the model showed little difference in results.

Martin et al. (June 1, 2020). Modelling Testing Frequencies Required for Early Detection of a SARS-CoV-2 Outbreak on a University Campus. Preprint downloaded June 2 from <https://doi.org/10.1101/2020.06.01.20118885>

Other Resources and Commentaries

- [SARS-CoV-2 Infection the Environmental Endurance of the Virus Can Be Influenced by the Increase of Temperature](#) – Medrxiv (Jun 1)
- [A Cohort Study to Evaluate the Effect of Combination Vitamin D Magnesium and Vitamin B12 \(DMB\) on Progression to Severe Outcome in Older COVID-19 Patient](#) – Medrxiv (Jun 2)
- [Greater Risk of Severe COVID-19 in Non-White Ethnicities Is Not Explained by Cardiometabolic Socioeconomic or Behavioural Factors or by 25\(OH\)-Vitamin D Status: Study of 1326 Cases from the UK Biobank](#) – Medrxiv (Jun 2)
- [Environmental Contamination of SARS-CoV-2 in a Non-Healthcare Setting Revealed by Sensitive Nested RT-PCR](#) – Medrxiv (Jun 2)
- [Airborne Spread of SARS-CoV-2 and a Potential Role for Air Disinfection](#) – JAMA (Jun 1)
- [Urinary Frequency as a Possibly Overlooked Symptom in COVID-19 Patients: Does SARS-CoV-2 Cause Viral Cystitis?](#) – European Urology (May 12)
- [Meeting the Transitional Care Needs of Older Adults with COVID-19](#) – Journal of Aging & Social Policy (May 31)
- [Characteristics of Hospitalized Pediatric COVID-19 Cases - Chicago, Illinois, March - April 2020](#) – Journal of the Pediatric Infectious Diseases Society (Jun 1)
- [Mortality and Pulmonary Complications in Patients Undergoing Surgery with Perioperative SARS-CoV-2 Infection: An International Cohort Study](#) – Lancet (May 29)

Report prepared by the UW MetaCenter 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