

2019-nCoV Literature Situation Report (Lit Rep)

July 17, 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

- **Based on simulation models informed by measurements of exhaled aerosol particles, risk of aerosol transmission depends both on emitter behavior (speaking versus normal breathing) and ventilation systems. The location of ventilation in lecture halls and grocery stores could affect transmission risk. [More](#)**
- **The distribution of SARS-CoV-2 viral loads in a large number of respiratory samples identified that 15% of samples had extremely high viral loads (>8 log₁₀ copies/ml) while 10% had low viral loads (<1000 copies/ml), potentially indicating variability in infectiousness between cases. [More](#)**
- **Among nearly 20,000 individuals with detectable anti-spike antibodies, the vast majority had high antibody titers, and 50% of samples with low titers were still able to neutralize virus. In a follow-up subset, titers were found to be largely stable or increasing. [More](#)**
- **Nearly 75% of residents of Community Living Centers operated by the Veterans Administration who tested positive during universal screening for SARS-CoV-2 did not meet a fever threshold of 38°C. [More](#)**
- **Among almost 60,000 contacts of nearly 6,000 COVID-19 cases in South Korea, 12% of the household contacts developed COVID-19 versus 2% of the contacts from outside the household. [More](#)**

Transmission

- [pre-print, not peer-reviewed] Shao et al. combined measured aerosol generation from 8 study participants with mathematical simulations to estimate risk of SARS-CoV-2 aerosol spread under scenarios including an elevator, lecture hall, and supermarket. Simulations indicated that SARS-CoV-2 aerosol transmission in an elevator under high ventilation would be very low with normal breathing, but would increase if the emitter is speaking.
- In a classroom in which the emitter is a lecturer speaking continuously, risk to students is lowest if ventilation is located near the emitter.
- Changing the location of ventilation within a supermarket may alter the risk to shoppers throughout the store and cashiers at the front in different ways.

Shao et al. (July 2020). Risk Assessment of Airborne Transmission of COVID-19 by Asymptomatic Individuals under Different Practical Settings. Pre-print downloaded July 17 from <https://arxiv.org/abs/2007.03645>

Testing and Treatment

- Skipper et al. report findings of a randomized, double-blind placebo-controlled trial of oral hydroxychloroquine (800mg once, followed by 600mg in 6-8 hours, then 600mg daily for 4 days) among symptomatic non-hospitalized adults with laboratory-confirmed COVID-19 or probable COVID-19 (n=423). Patients in the hydroxychloroquine arm had a non-significantly lower probability of ongoing symptoms at 14 days (24% versus 30%; p=0.21). There were 5 events of hospitalization and/or death within 14 days among the hydroxychloroquine arm compared to 10 events in the placebo arm (p=0.29).
- Risk of medication-related adverse effects was significantly higher in the hydroxychloroquine arm (43% versus 22%), with gastrointestinal effects being most commonly reported and no serious adverse events attributable to hydroxychloroquine.

Skipper et al. (July 2020). Hydroxychloroquine in Nonhospitalized Adults With Early COVID-19: A Randomized Trial. Annals of Internal Medicine. <https://doi.org/10.7326/M20-4207>

- Kleiboeker et al. report the distribution of viral loads in a large number of SARS-CoV-2-positive respiratory samples (n=4,428). Fifteen percent of samples had extremely high virus levels (>8 log₁₀ copies/ml), while low viral loads (<1000 copies/ml) were relatively common (10%). Neither age nor gender were meaningfully associated with mean and median viral load. The authors also review challenges in comparing viral load values between studies.

Kleiboeker et al. (May 2020). SARS-CoV-2 Viral Load Assessment in Respiratory Samples. Journal of Clinical Virology. <https://doi.org/10.1016/j.jcv.2020.104439>

Clinical Characteristics and Health Care Setting

- A systematic literature review and meta-analysis (n=51 studies) of neurological and musculoskeletal features of COVID-19 found the prevalence of smell impairment was 35% (95% CI 0-94%), 33% for taste impairment (95% CI 0-91%), 19% for myalgia (95% CI 16-23%), 12% for headache (95% CI 9-15%), 10% for back pain (95% CI 1%-23%), 10% for dizziness (95% CI 3-19%), 3% for acute cerebrovascular disease (95% CI 1-5%), and 2% for impaired consciousness (95% CI 1-2%). There was substantial heterogeneity between studies (large I² values) indicating substantial differences in the prevalence of several of these symptoms between included studies.

Abdullahi et al. (2020). Neurological and Musculoskeletal Features of COVID-19: A Systematic Review and Meta-Analysis. Frontiers in Neurology. <https://doi.org/10.3389/fneur.2020.00687>

- Among adults (n=2,491) hospitalized with laboratory-confirmed COVID-19 from March 1 to May 2 identified through COVID-NET (154 hospitals in 74 counties and 13 states), 92% had one or more underlying condition, 32% required ICU admission, 19% required invasive mechanical ventilation, and 17% died. Older age, male sex, obesity, immunosuppression, and diabetes were positively associated with ICU admission. These factors, as well as renal disease, chronic lung disease, cardiovascular disease, and neurological disorders were positively associated with in-hospital mortality.

Kim et al. (July 2020). Risk Factors for Intensive Care Unit Admission and In-Hospital Mortality among Hospitalized Adults Identified through the U.S. Coronavirus Disease 2019 (COVID-19)-Associated Hospitalization Surveillance Network (COVID-NET). Clinical Infectious Diseases. <https://doi.org/10.1093/cid/ciaa1012>

- A community-based prospective cohort study using UK Biobank data found that current smoking, physical inactivity, obesity/overweight, and diabetes were all positively associated with SARS-CoV-2 risk (adjusted for age, sex, alcohol intake, education, and ethnicity, and other CVD risk factors). There was no evidence of association for systolic blood pressure. Total cholesterol and HDL were associated with lower risk. Framingham risk score was positively associated with SARS-CoV-2 in the two highest quintiles, but not at intermediate or lower values.

Batty and Hamer. (July 16, 2020). Vascular Risk Factors, Framingham Risk Score, and COVID-19: Community-Based Cohort Study. Cardiovascular Research. <https://doi.org/10.1093/cvr/cvaa178>
- [pre-print, not peer-reviewed]* Among over 50,000 individuals with confirmed or suspected SARS-CoV-2 infection or exposure to someone with COVID-19, nearly 20,000 individuals had detectable antibodies. Of those who were antibody positive, 22% had moderate and 71% had high titers for anti-spike antibodies. Approximately half of the samples with low titers were able to neutralize virus, versus 90% and 100% of the samples with moderate and high titers, respectively. Among 121 donors selected for repeat titers (at a mean of 82 days post symptom onset), there was a slight drop in mean titer among those with high titers, while titers increased among those with initially low to moderate titers.

Wajnberg et al. (July 17, 2020). SARS-CoV-2 Infection Induces Robust Neutralizing Antibody Responses That Are Stable for at Least Three Months. Pre-print downloaded July 17 from <https://doi.org/10.1101/2020.07.14.20151126>
- Among 7,325 residents of Community Living Centers operated by the Veterans Administration, which perform daily symptoms screening for COVID-19 and conducted universal RT-PCR testing on April 14, SARS-CoV-2 was detected in 6% of residents. Temperatures were elevated in positive participants relative to negatives from 7 days before testing and remained elevated during the 14 day follow-up, but only 27% of positives met the fever threshold of 38°C during the study period.

Rudolph et al. (July 2020). Temperature in Nursing Home Residents Systematically Tested for SARS-CoV-2. Journal of the American Medical Directors Association. <https://doi.org/10.1016/j.jamda.2020.06.009>
- Among 3,357 skilled nursing facilities (SNFs) from at least 25 US states, including a subset of 64 SNFs that performed universal testing, 23% of SNFs had COVID-19 outbreaks. Larger facility size was associated with a significantly higher probability of an outbreak. There was no association between the likelihood of an outbreak and past infection control citations or a measure of SNF quality.

White et al. (July 2020). Variation in SARS-CoV-2 Prevalence in US Skilled Nursing Facilities. Journal of the American Geriatrics Society. <https://doi.org/10.1111/jgs.16752>
- Collins et al. present a case series of people living with HIV (PLWH) admitted with COVID-19 at three hospitals in Atlanta, GA between March 8 and April 23. They found that 4% of hospitalized COVID-19 cases were PLWH. Of these patients, the median age was 57, 65% were men, and 85% were non-Hispanic Black. Cough, fever, malaise, and breathing difficulty were the most commonly reported symptoms. Thirty percent required intensive care, 15% needed intubation, and 15% died, all of whom had CD4 count >200, HIV suppression, and multiple comorbidities.

Collins et al. (July 14, 2020). Clinical Characteristics, Comorbidities and Outcomes among Persons with HIV Hospitalized with Coronavirus Disease 2019 in Atlanta, GA. AIDS. <https://doi.org/10.1097/QAD.0000000000002632>

Mental Health and Personal Impact

- Compared to individuals reporting no current mental health diagnosis, those with self-reported current anxiety-related or mood disorders had higher COVID Stress Scale total scores, in particular higher scores on fears about danger and contamination, socioeconomic consequences, xenophobia, and traumatic stress symptoms. They were furthermore more likely to voluntarily self-isolate and report greater self-isolation stressors and distress.

Asmundson et al. (July 2020). Do Pre-Existing Anxiety-Related and Mood Disorders Differentially Impact COVID-19 Stress Responses and Coping? Journal of Anxiety Disorders.

<https://doi.org/10.1016/j.janxdis.2020.102271>

- *[pre-print, not peer-reviewed]* An online survey of adults in the UK, Ireland, New Zealand and Australia within the first 2-6 weeks of government mandated COVID-19 restrictions found that patients who reported a negative change in exercise behavior demonstrated poorer mental health and well-being than those with no or improved exercise behavior. Women reported more positive changes in exercise behavior, young people (18-29 years) reported more negative changes, and individuals in New Zealand reported better mental health and well-being.

Faulkner et al. (July 16, 2020). Physical Activity Mental Health and Well-Being of Adults during Early COVID-19 Containment Strategies A Multi-Country Cross-Sectional Analysis. Pre-print

downloaded July 17 from <https://doi.org/10.1101/2020.07.15.20153791>

Public Health Policy and Practice

- Among 59,073 contacts of 5,706 COVID-19 index cases in South Korea monitored for an average of 9.9 days after index case diagnosis, 12% of household contacts acquired COVID-19, versus 2% for non-household contacts. Probability of a contact being positive was highest for household contacts when the index case was 10-19 years old (19%); however, only 2% of index cases were in this age group. Among non-household contacts, the highest proportion of positive contacts was among index case who were 70 years of age or older.

Park et al. (Oct 2020). Contact Tracing during Coronavirus Disease Outbreak, South Korea, 2020. Emerging Infectious Diseases. <https://doi.org/10.3201/eid2610.201315>

Other Resources and Commentaries

- [The Impact of Host Resistance on Cumulative Mortality and the Threshold of Herd Immunity for SARS-CoV-2](#) – medRxiv (July 16)
- [Modelling Scenarios of the Epidemic of COVID-19 in Canada](#) – Canada Communicable Disease Report (June 4)
- [Allowing Visitors Back in the Nursing Home During the COVID-19 Crisis: A Dutch National Study Into First Experiences and Impact on Well-Being](#) – Journal of the American Medical Directors Association (July)
- [Understanding Covid-19 Transmission: The Effect of Temperature and Health Behavior on Transmission Rates](#) – Infection, Disease & Health (July 7)
- [COVID-19 Detection on Chest X-Ray and CT Scan Images Using Multi-Image Augmented Deep Learning Model](#) – bioRxiv (July 17)
- [The COVID-19 Shadow Pandemic: Meeting Social Needs For A City In Lockdown](#) – Health Affairs (July 16)
- [How Mental Health Care Should Change as a Consequence of the COVID-19 Pandemic](#) – The Lancet Psychiatry (July 16)

- [Population Health, Economics and Ethics in the Age of COVID-19](#) – BMJ Global Health (July)
- [Racial/Ethnic Disparities in COVID-19 Hospital Admissions](#) – medRxiv (July 17)
- [Nursing Home Characteristics Associated With COVID-19 Deaths in Connecticut, New Jersey, and New York](#) – Journal of the American Medical Directors Association (July)
- [Sex and Careers of University Students in Educational Practices as Factors of Individual Differences in Learning Environment and Psychological Factors during COVID-19](#) – International Journal of Environmental Research and Public Health (July 5)
- [Efficacy of a Test-Retest Strategy in Residents and Health Care Personnel of a Nursing Home Facing a COVID-19 Outbreak](#) – Journal of the American Medical Directors Association (July)
- [Do the Benefits of COVID-19 Policies Exceed the Costs? Exploring Uncertainties in the Age-VSL Relationship](#) – Risk Analysis (July 16)

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