

2019-nCoV Literature Situation Report (Lit Rep)

October 9, 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

- **Children with asthma or obesity who were hospitalized with SARS-CoV-2 were at increased risk for critical care admission or need for respiratory support.** [More](#)
- **Two thirds of adults with non-critical COVID-19 in an observational study had persistent symptoms up to 2 months after initial symptom onset, including loss of taste or smell, difficulty breathing, or fatigue.** [More](#)
- **COVID-19 attributable mortality in patients with pre-existing cancer was associated with older age, a higher Charlson comorbidity score, and certain types of cancer.** [More](#)
- **A study of children infected with SARS-CoV-2 indicated that among children for whom the source of infection was identified, 74% were infected by a member of their household.** [More](#)

Transmission

- A systematic review and meta-analysis of the secondary attack rate (SAR) of SARS-Cov-2 in household and healthcare settings indicated that the SAR among symptomatic people was higher than that for asymptomatic people (RR=3.2). The SAR is the proportion of contacts of a SARS-CoV-2 case who subsequently became infected. Adults showed higher susceptibility to infection than children (RR=1.7), and spouses of index cases were more likely to be infected compared to other household contacts (RR=2.4). In healthcare settings, the pooled SAR was estimated at 0.7%, while the pooled household SAR was estimated at 18%. The authors suggest that these results indicate a need to account for setting-specific transmission risk, and that individuals with confirmed infection should be isolated away from other household members when possible.

Koh et al. (Oct 8, 2020). What Do We Know about SARS-CoV-2 Transmission? A Systematic Review and Meta-Analysis of the Secondary Attack Rate and Associated Risk Factors. PLOS ONE. <https://doi.org/10.1371/journal.pone.0240205>

- A study of 203 children infected with SARS-CoV-2 indicated that infection is typically asymptomatic or mild during childhood, and that most children have moderate or high viral loads regardless of age, symptoms, or severity of infection. Among children for whom the source of infection was identified, 74% were infected by a member of their household. In 67% of family clusters, an adult with COVID-19 was the first case, suggesting that adults play an important role in the transmission of SARS-Cov-2 within families.

Maltezou et al. (Oct 6, 2020). Children and Adolescents With SARS-CoV-2 Infection. Pediatric Infectious Disease Journal. <https://doi.org/10.1097/INF.0000000000002899>

- Among the 767 US hotspot counties identified by the CDC during June and July 2020, early increases in the percent positivity for SARS-CoV-2 among people under age 24 years were followed by several weeks of increasing percent positivity in those older than age 25. The authors note that these findings corroborate regional patterns in the southern United States and provide evidence that among young adults, those aged 18–24 years demonstrate the earliest increases in percent positivity. The authors conclude that these findings highlight the importance of reducing transmission from younger populations to those at highest risk for severe illness or death and emphasize the need for health care preparedness in counties with high percent positivity rates among younger people.

Oster et al. (Oct 9, 2020). Transmission Dynamics by Age Group in COVID-19 Hotspot Counties — United States, April–September 2020. MMWR. <https://doi.org/10.15585/mmwr.mm6941e1>

Testing and Treatment

- Among 86 pregnant and postpartum women with severe COVID-19 who received compassionate use of remdesivir, recovery rates were high (93% for pregnant women and 89% for postpartum women) and there were few serious adverse events (16% of all participants). At the beginning of treatment with remdesivir, 40% of pregnant women required invasive ventilation, compared to 95% of postpartum women. At 28-day follow-up, 93% of pregnant women who had been on mechanical ventilation had been extubated, 93% had recovered, and 90% were discharged. Among postpartum women, 89% had been extubated, 89% had recovered, and 84% were discharged. *[EDITORIAL NOTE: The lack of a comparable group that did not receive remdesivir means that it is not possible to evaluate the efficacy of treatment in this study population.]*

Burwick et al. (Oct 8, 2020). Compassionate Use of Remdesivir in Pregnant Women with Severe Covid-19. Clinical Infectious Diseases. <https://doi.org/10.1093/cid/ciaa1466>

- Preemptive therapy with tocilizumab to prevent the consequences of cytokine storm was associated with early favorable outcomes in 77% of patients hospitalized with COVID-19 and death occurred in 6% of treated patients in a study of 64 patients in Spain. estimated mortality of 10 to 20% in comparably ill patients. *[EDITORIAL NOTE: The lack of a control group and the relatively small sample size limits the interpretability of these findings.]*

Guillén et al. (Dec 8, 2020). Preemptive Interleukin-6 Blockade in Patients with COVID-19. Scientific Reports. <https://doi.org/10.1038/s41598-020-74001-3>

- The RECOVERY trial found that patients hospitalized with COVID-19 who received hydroxychloroquine did not have a lower incidence of death by 28 days after enrollment compared to those who received usual care. The randomized open-label platform trial found that patients in the hydroxychloroquine group were less likely to be discharged from the hospital alive within 28 days than those in the usual-care group (60% vs 63%). Among patients who were not on a ventilator at baseline, those in the hydroxychloroquine group had a higher frequency of invasive mechanical ventilation or death (31% vs 27%). There was a small numerical excess of cardiac deaths (0.4%) but no difference in the incidence of new major cardiac arrhythmia among the patients who received hydroxychloroquine.

Horby et al. (Oct 8, 2020). Effect of Hydroxychloroquine in Hospitalized Patients with Covid-19. New England Journal of Medicine. <https://doi.org/10.1056/NEJMoa2022926>

- A study comparing the performance characteristics of four high-throughput assays for SARS-CoV-2 antibody detection indicated that for samples collected from patients 14 or more days after

symptom onset, the Roche and Siemens assays had the highest sensitivities (96.6% and 98.3%, respectively) and specificities (100% for both) out of the four tests. The authors note that the sensitivity and specificity of these tests would make them particularly valuable in regions with lower SARS-CoV-2 prevalence.

Manthei et al. (Oct 9, 2020). Differences in Performance Characteristics Among Four High-Throughput Assays for the Detection of Antibodies Against SARS-CoV-2 Using a Common Set of Patient Samples. American Journal of Clinical Pathology. <https://doi.org/10.1093/ajcp/aqaa200>

Vaccines and Immunity

- Profiling of IgG, IgA, and IgM antibody response to the SARS-CoV-2 spike protein and its receptor-binding domain (RBD) indicated that anti-SARS-CoV-2 antibody responses were readily detected in serum and saliva from patients with COVID-19, with peak IgG levels occurring 16 to 30 days after symptom onset. IgA and IgM antibodies rapidly decayed over time, although IgG antibodies remained relatively stable up to 105 days after symptom onset in both serum and saliva. Additionally, antibody responses to the spike protein and RBD in serum positively correlated with matched saliva samples. The authors note that based on this correlation, IgG responses in saliva may serve as a surrogate measure of systemic immunity to SARS-CoV-2.

Isho et al. (Oct 2020). Persistence of Serum and Saliva Antibody Responses to SARS-CoV-2 Spike Antigens in COVID-19 Patients. Science Immunology. <https://pubmed.ncbi.nlm.nih.gov/33033173>

- A study of antibody responses after COVID-19 infection in patients in Bangladesh indicated that while people who had mild symptoms generated an immune response, those who had no symptoms had lower antibody levels or did not generate any detectable immune response. IgM and IgA responses developed by day 14 after confirmation of infection in 72% and 83% of individuals with mild symptoms, respectively, and 100% of them developed IgG responses by day 30. In contrast, people without symptoms developed antibody responses significantly less frequently, with only 20% positive for IgA and 22% positive for IgM by day 14, and 45% positive for IgG 30 days after infection.

Shirin et al. (Oct 2020). Antibody Responses after COVID-19 Infection in Patients Who Are Mildly Symptomatic or Asymptomatic in Bangladesh. International Journal of Infectious Diseases. <https://doi.org/10.1016/j.ijid.2020.09.1484>

Clinical Characteristics and Health Care Setting

- Children with comorbidities who were hospitalized with SARS-CoV-2 were at increased risk for critical care admission and/or need for respiratory support, based on results from a multicenter, retrospective cohort study at four hospitals in the New York City metropolitan area. Obesity was the most commonly observed risk factor for critical care (63% vs. 28%), while children with asthma were more likely to receive respiratory support (28% vs. 8%), with no difference in need for critical care (P=0.26). Children admitted to critical care also had higher prevalence of renal dysfunction at presentation (43% vs. 10%).

Verma et al. (Oct 2020). Characteristics of Hospitalized Children With SARS-CoV-2 in the New York City Metropolitan Area. Hospital Pediatrics. <https://pubmed.ncbi.nlm.nih.gov/33033078>

- Two-thirds of adults with non-critical COVID-19 experienced persisting symptoms up to 2 months after initial onset, with symptoms including loss of taste or smell, difficulty breathing, and fatigue. In an observational study of 150 patients with mild or moderate COVID-19, persisting symptoms at 60 days were significantly more common among those age 40 to 60 years old, those admitted to

hospital, and those with abnormal-sounding lungs at symptom onset. In addition, one third of patients reported still feeling sick or that they were in worse condition at day 60 than they were at symptom onset.

Carvalho-Schneider et al. (Oct 2020). Follow-up of Adults with Non-Critical COVID-19 Two Months after Symptoms' Onset. Clinical Microbiology and Infection.
<https://doi.org/10.1016/j.cmi.2020.09.052>

- The pre-existence of cancer may affect both susceptibility to COVID-19 infection and outcomes, according to an analysis of healthcare records from the US Veterans Affairs healthcare system. The overall COVID-19 attributable mortality in patients with cancer was 10%, which was higher with older age, a higher Charlson comorbidity score, and certain types of cancer. The analysis found that recent or past cancer treatment did not impact attributable mortality. Additionally, while Black patients had 3.5-fold higher COVID-19 attributable hospitalization, they had similar attributable mortality to that of white patients.

Fillmore et al. (Oct 8, 2020). Prevalence and Outcome of COVID-19 Infection in Cancer Patients: A National Veterans Affairs Study. JNCI: Journal of the National Cancer Institute.
<https://doi.org/10.1093/jnci/djaa159>

- A study of brain tissue from patients who died from COVID-19 indicated that 79% had pronounced neuroinflammatory changes in the brainstem and cerebellum, though in general, neuropathological changes seemed to be mild in most patients. SARS-CoV-2 was detected in 53% of the patients' brains, and the study found no evidence for central nervous system damage directly caused by SARS-CoV-2. The authors highlight the need for future studies to validate these findings, as no age- or sex-matched controls were included.

Matschke et al. (Oct 2020). Neuropathology of Patients with COVID-19 in Germany: A Post-Mortem Case Series. The Lancet Neurology. [https://doi.org/10.1016/S1474-4422\(20\)30308-2](https://doi.org/10.1016/S1474-4422(20)30308-2)

- An assessment of the seroprevalence of SARS-CoV-2 antibodies, self-reported symptoms, and occupational exposure to SARS-CoV-2 among 2,149 healthcare workers at a hospital in Sweden found that 19% had IgG antibodies against SARS-CoV-2, which was higher than the regional seroprevalence during that time period. Seroprevalence was associated with a loss of smell (OR=28.4), loss of taste (OR=19.2), patient contact (OR=2.9) and COVID-19 patient contact (OR=3.3).

Rudberg et al. (Dec 8, 2020). SARS-CoV-2 Exposure, Symptoms and Seroprevalence in Healthcare Workers in Sweden. Nature Communications. <https://doi.org/10.1038/s41467-020-18848-0>

Public Health Policy and Practice

- Among young adults in one county in Wisconsin, perceived low severity of disease, perceived responsibility to others, peer pressure, and exposure to misinformation regarding masks were identified as drivers of behaviors that might impact risk of COVID-19 exposure. The authors suggest that behavior change messages that highlight both personal responsibility and responsibility to protect others might encourage young adults to adhere to public health guidelines that prevent the spread of COVID-19.

Wilson et al. (Oct 9, 2020). Factors Influencing Risk for COVID-19 Exposure Among Young Adults Aged 18–23 Years — Winnebago County, Wisconsin, March–July 2020. MMWR
<https://doi.org/10.15585/mmwr.mm6941e2>

Other Resources and Commentaries

- [Evidence of initial success for China exiting COVID-19 social distancing policy after achieving containment](#) – Wellcome Open Research (Oct 2020)
- [Scientific Publications During the Early Phase of the COVID-19 Pandemic: A Topic Modeling Study \(Preprint\)](#) – Journal of Medical Internet Research (Oct 2020)
- [Antiviral monotherapy for hospitalised patients with COVID-19 is not enough](#) – The Lancet (Oct 2020)
- [Long-term Health Consequences of COVID-19](#) – JAMA (Oct 2020)
- [Catch me if you can: SARS-CoV-2 detection in brains of deceased patients with COVID-19](#) – The Lancet Neurology (Oct 2020)
- [SARS-CoV-2: how safe is it to fly and what can be done to enhance protection?](#) - Transactions of The Royal Society of Tropical Medicine and Hygiene (Oct 2020)
- [A cross-country database of COVID-19 testing](#) - Scientific Data (Oct 2020)
- [Leveraging Implementation Science in the Public Health Response to COVID-19](#) – Public Health Reports (Oct 2020)
- [COVID-19 in Children: Looking Forward, Not Back](#) – Pediatrics (Oct 2020)
- [The Opioid Epidemic Within the COVID-19 Pandemic: Drug Testing in 2020](#) – Population Health Management (Oct 2020)
- [Who complies with COVID-19 transmission mitigation behavioral guidelines?](#) – PLOS ONE (Oct 2020)
- [Advancing toward normal operations for arenas and stadiums](#) – Toxicology and Industrial Health (Oct 2020)
- [The value proposition of the Global Health Security Index](#) – BMJ Global Health (Oct 2020)
- [Covid 19: NEJM and former CDC director launch stinging attacks on US response](#) – BMJ (Oct 2020)
- [Inhibiting Ebola virus and SARS-CoV-2 entry](#) – Science (Oct 2020)

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