

2019-nCoV Literature Situation Report (Lit Rep) September 24, 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 modified SARS-CoV-2 PCR testing procedure that eliminated the bottleneck step of RNA extraction achieved high sensitivity and specificity.** [More](#)
- **Only 0.9% of patients who underwent repeat SARS-CoV-2 testing in Wisconsin experienced a negative-to-positive conversion, suggesting that repeat testing may have limited utility in low-prevalence settings.** [More](#)
- **Among pregnant persons in labor, frequency of preeclampsia was higher among SARS-CoV-2 PCR positive than negative patients (8% vs 4%) while induction of labor was less common (19% vs 30%). Other maternal and neonatal outcomes did not differ significantly.** [More](#)
- **Widely available SARS-CoV-2 IgG assays (Abott, DiaSorine, Roche, and Siemens) and a novel immunoassay (Oxford) all achieved $\geq 98\%$ sensitivity and $\geq 98\%$ specificity when evaluated with identical sample sets taken 30 days or more post-symptom onset.** [More](#)

Testing and Treatment

- Four commercial and widely available SARS-CoV-2 IgG assays (Abott, DiaSorine, Roche, and Siemens), and a novel immunoassay (Oxford) were evaluated for performance using identical sample sets. All assays achieved a sensitivity $\geq 98\%$ and specificity $\geq 98\%$ on samples taken 30 days or more post-symptom onset, based on 976 pre-pandemic blood samples collected in 2014-2016 and 536 blood samples collected from lab-confirmed COVID-19 patients.
Ainsworth et al. (Sept 23, 2020). Performance Characteristics of Five Immunoassays for SARS-CoV-2: A Head-to-Head Benchmark Comparison. The Lancet Infectious Diseases.
[https://doi.org/10.1016/S1473-3099\(20\)30634-4](https://doi.org/10.1016/S1473-3099(20)30634-4)
- In a randomized, placebo-controlled trial of N-acetylcysteine (NAC) in Brazil among people with severe COVID-19, the frequency of intubation was similar in the NAC (20.6%) vs. placebo (23.9%) groups ($p=0.68$). No differences in secondary endpoints (ICU admission, time in ICU, and mortality) were observed.
de Alencar et al. (Sept 23, 2020). Double-Blind, Randomized, Placebo-Controlled Trial with N-Acetylcysteine for Treatment of Severe Acute Respiratory Syndrome Caused by COVID-19. Clinical Infectious Diseases. <https://doi.org/10.1093/cid/ciaa1443>
- Among 660 patients with at least 2 nasopharyngeal SARS-CoV-2 PCR tests collected on different days in a low prevalence area of Wisconsin, only 6 (0.9%) negative-to-positive conversions were detected.

All 6 were outpatient persons under investigation (PUI) for suspected COVID-19. Overall, 29.6% of repeat PUI testing and 31.4% of repeat asymptomatic screens should not have been performed based on institutional guidance, with the most common reason being provider judgement.

Lepak et al. (Aug 27, 2020). Utility of Repeat Nasopharyngeal SARS-CoV-2 RT-PCR Testing and Refinement of Diagnostic Stewardship Strategies at a Tertiary Care Academic Center in a Low-Prevalence Area of the United States. Open Forum Infectious Diseases.

<https://doi.org/10.1093/ofid/ofaa388>

- Tocilizumab was associated with a lower mortality (RR:0.27, 95% CI: 0.12-0.59; risk difference 12%, 95% CI: 4.6%-20%) based on pooled data from 10 studies comprising 1358 patients with COVID-19. The number needed to treat was 11, suggesting that 1 death is prevented for every 11 patients with severe COVID-19 treated with tocilizumab. No differences in side effects were observed.

Malgie et al. (Sept 23, 2020). Decreased Mortality in COVID-19 Patients Treated with Tocilizumab: A Rapid Systematic Review and Meta-Analysis of Observational Studies. Clinical Infectious Diseases. <https://doi.org/10.1093/cid/ciaa1445>

- Smyrlaki et al. developed a streamlined protocol for SARS-CoV-2 testing using RT-PCR directly on heat-inactivated samples and lysates without the need for RNA extraction, which is a bottleneck in PCR testing. Their protocol achieved a sensitivity of 96% and specificity of 99.8% compared to conventional RT-PCR. The authors suggest that this novel protocol could have significant time and cost savings and help expand COVID-19 testing.

Smyrlaki et al. (Sept 23, 2020). Massive and Rapid COVID-19 Testing Is Feasible by Extraction-Free SARS-CoV-2 RT-PCR. Nature Communications. <https://doi.org/10.1038/s41467-020-18611-5>

Clinical Characteristics and Health Care Setting

- In a Swedish study conducted among pregnant women in labor, 5.8% of 2,682 women tested positive for SARS-CoV-2 via RT-PCR. Positive patients were more likely to have preeclampsia (7.7% vs 4.3%; PR: 1.8; 95% CI: 1.0-3.4) and less likely to undergo induction of labor (18.7% vs 29.6%; PR: 0.6; 95% CI: 0.45-0.9). Other maternal and neonatal outcomes (mode of delivery, postpartum hemorrhage, preterm birth, Apgar scores, and birth weight for gestational age) did not differ significantly between groups.

Ahlberg et al. (Sept 23, 2020). Association of SARS-CoV-2 Test Status and Pregnancy Outcomes. JAMA. <https://doi.org/10.1001/jama.2020.19124>

- In a retrospective cohort study in China, 7% of 1,392 COVID-19 patients developed acute kidney injury (AKI) during hospitalization. In-hospital mortality was higher among patients with AKI even after adjustment for confounders (OR: 5.1; 95% CI: 2.7-9.7).

Cheng et al. (Sept 22, 2020). The Incidence, Risk Factors, and Prognosis of Acute Kidney Injury in Adult Patients with Coronavirus Disease 2019. Clinical Journal of the American Society of Nephrology. <https://doi.org/10.2215/CJN.04650420>

- Cancer diagnosis did not increase risk of death (OR: 1.05, 95% CI: 0.4-2.5) or severe outcomes (OR: 0.9, 95% CI: 0.7-24.0) among a matched cohort of hospitalized patients with COVID-19 (n=120). Cancer patients who had received systemic treatment within 28 days prior to hospital admission appeared to have a nonsignificantly increased risk of death (OR: 4.05, 95% CI: 0.68-23.95).

Joharatnam-Hogan et al. (Jan 14, 2020). Outcomes of the 2019 Novel Coronavirus in Patients with or without a History of Cancer: A Multi-Centre North London Experience. *Therapeutic Advances in Medical Oncology*. <https://doi.org/10.1177/1758835920956803>

Mental Health and Personal Impact

- Participants in a multi-country survey (n=2264) that assessed perceived efficacy of COVID-19 restrictions and mental health impact found that school closings had the strongest perceived effect on daily life. Risk perception of infection was higher among participants who believed that their country reacted too mildly. Dissatisfaction with government response corresponded to increased distress levels.

Mækellæ et al. (Aug 12, 2020). Perceived Efficacy of COVID-19 Restrictions, Reactions and Their Impact on Mental Health during the Early Phase of the Outbreak in Six Countries. *Royal Society Open Science*. <https://doi.org/10.1098/rsos.200644>

Modeling and Prediction

- [Pre-print, not peer reviewed] In a modeling study, US counties containing a college campus that reopened with in-person instruction were found to have an average COVID-19 incidence increase of 0.024 cases per 1,000 residents over a two week period. Case increases were larger in counties with colleges that drew students coming from areas with increasing rates.

Andersen et al. (Sept 23, 2020). College Openings Mobility and the Incidence of COVID-19 Cases. Pre-print downloaded Sept 24 from <https://doi.org/10.1101/2020.09.22.20196048>

- Achieving herd immunity to SARS-CoV-2 without overwhelming hospital capacity was found to be impractical in a modeling study, due to the need to change social distancing requirements over time and with little room for error. Suppression of SARS-CoV-2 transmission was possible with realistic levels of social distancing over several months. The transmission model was parameterized to the UK.

Brett and Rohani. (Sept 22, 2020). Transmission Dynamics Reveal the Impracticality of COVID-19 Herd Immunity Strategies. *Proceedings of the National Academy of Sciences*. <https://doi.org/10.1073/pnas.2008087117>

Public Health Policy and Practice

- Using data from national compensation claims, 19.4% of all COVID-19 cases in Italy and 30% of cases among working-age adults were associated with a claim of infection acquired at the workplace. The employment sectors that were most affected were human health workers and social workers, which correspond to employment categories classified as high-risk during the lockdown period.

Marinaccio et al. (Sept 23, 2020). Occupational Factors in the COVID-19 Pandemic in Italy: Compensation Claims Applications Support Establishing an Occupational Surveillance System. *Occupational and Environmental Medicine*. <https://doi.org/10.1136/oemed-2020-106844>

- Survey respondents who endorsed COVID-19 conspiracy theories about the origin of SARS-CoV-2 were less likely to report wearing a mask, perceive the pandemic as a threat, perceive vaccines as safe, and report an intention to be vaccinated in a national longitudinal survey conducted in the US

in March (n=1,050) and July (n=840). Vaccine hesitancy increased between survey waves and was positively associated with conspiracy beliefs.

Romer and Jamieson. (Sept 21, 2020). Conspiracy Theories as Barriers to Controlling the Spread of COVID-19 in the U.S. Social Science & Medicine.

<https://doi.org/10.1016/j.socscimed.2020.113356>

Other Resources and Commentaries

- [Epidemiological Measures for Informing the General Public during the SARS-CoV-2-Outbreak Simulation Study about Bias by Incomplete Case-Detection](#) – MedRxiv (Sept 24)
- [The BMJ Interview: Anthony Fauci on Covid-19](#) – BMJ (Sept 23)
- [Making Data Reports Useful During the COVID-19 Pandemic](#) – Cureus (Aug 22)
- [An Expert Judgment Model to Predict Early Stages of the COVID-19 Outbreak in the United States](#) – MedRxiv (Sept 23)
- [Community Health Workers and Covid-19 — Addressing Social Determinants of Health in Times of Crisis and Beyond](#) – New England Journal of Medicine (Sept 23)
- [Audio Interview: Eight Months of Action and Inaction against Covid-19](#) – New England Journal of Medicine (Sept 24)
- [As Their Numbers Grow, COVID-19 “Long Haulers” Stump Experts](#) – JAMA (Sept 23)
- [Evaluating and Deploying Covid-19 Vaccines — The Importance of Transparency, Scientific Integrity, and Public Trust](#) – New England Journal of Medicine (Sept 23)
- [COVID-19 Clinical Trials: Learning from Exceptions in the Research Chaos](#) – Nature Medicine (Sept 22)

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