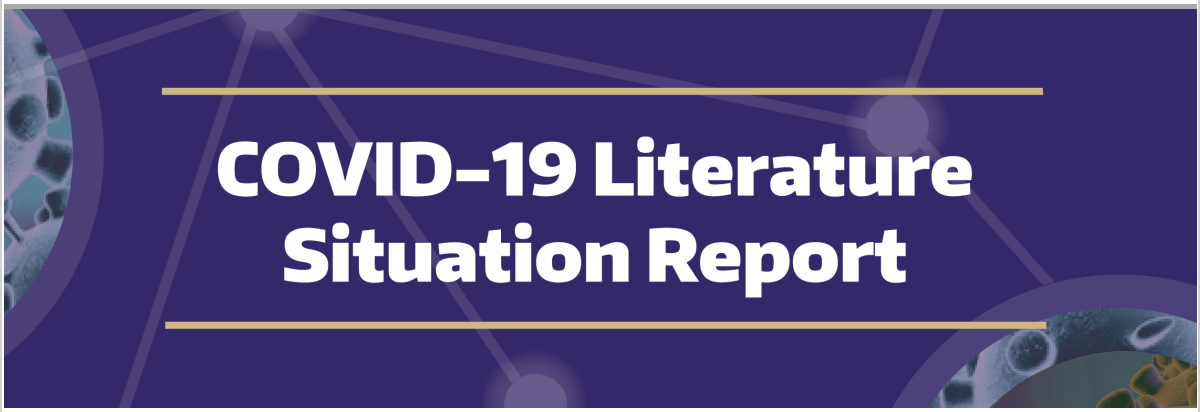
Washington State Department of Health

DEPARTMENT OF GLOBAL HEALTH
UNIVERSITY of WASHINGTON



COVID-19 Literature Situation Report

JULY 1, 2020

The scientific literature on COVID-19 is rapidly evolving and these articles were selected for review based on their relevance to 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.

The COVID-19 Literature Report is researched, compiled, and edited daily by students and faculty in the University of Washington Schools of Public Health and Medicine. The editors are Brandon Guthrie PhD and Jennifer Ross MD MPH. Contributors include Diana Tordoff MPH, Julianne Meisner BVM&S MS, Lorenzo Tolentino BS, Wenwen Jiang MPH, Sherrilynne Fuller PhD FACMI, Dylan Green MPH, Diana Louden MLib, Ashley Tseng MPH and Jessie Seiler MPH.

Today's summary is based on a review of 445 articles (388 published, 57 in preprint).

KEY TAKEAWAYS

- **Patient-collected lower nasal specimens had diagnostic equivalence to healthcare worker-collected lower nasal and oropharyngeal specimens for detection of SARS-CoV-2 by RT-PCR.** More
- **SARS-CoV-2 viral loads in upper respiratory specimens peaked within 2-3 days from symptom onset and decreased rapidly in a study among health care personnel with non-severe COVID-19.** More
- **SARS-CoV-2 antibody levels significantly decreased after heat inactivation of serum, which is a proposed method of reducing exposure risk for laboratory personnel. IgM levels decreased by 54% and IgG by 50%.** More

- **A meta-analysis of 19 studies found that hypertension was significantly associated with adverse outcomes in COVID-19.** More

Transmission

• Among 23 children infected with SARS-CoV-2, L'Huillier et al. found that symptomatic neonates, children, and teenagers shed infectious, culture-competent SARS-CoV-2, suggesting that transmission from children is plausible.

L'Huillier et al. (June 30, 2020). Culture-Competent SARS-CoV-2 in Nasopharynx of Symptomatic Neonates, Children, and Adolescents. Emerging Infectious Diseases. https://doi.org/10.3201/eid2610.202403

• Shrestha et al. examined SARS-CoV-2 viral load over time among 230 health care personnel with COVID-19 who did not require hospitalization. Viral loads in the upper respiratory specimens (n=528) peaked by 2 or 3 days from symptom onset and decreased rapidly thereafter, with >85% of the area under the curve occurring in the first five days.

Shrestha et al. (June 29, 2020). Distribution of Transmission Potential during Non-Severe COVID-19 Illness. Clinical Infectious Diseases. https://doi.org/10.1093/cid/ciaa886

Testing and Treatment

• Sensitivity and specificity were equivalent for patient-collected lower nasal specimens, physician-collected lower nasal specimens, and physician-collected oropharyngeal specimens in participants with SARS-CoV-2 infection (n=30) for detection by RT-PCR. Sensitivity of patient-collected specimens was 100% (95% CI: 72%-100%), and the specificity was 95% (95% CI: 74%-100%).

Altamirano et al. (June 12, 2020). Assessment of Sensitivity and Specificity of Patient-Collected Lower Nasal Specimens for Sudden Acute Respiratory Syndrome Coronavirus 2 Testing. JAMA Network Open. https://doi.org/10.1001/jamanetworkopen.2020.12005

• SARS-CoV-2 antibody levels decreased significantly after heat inactivation of serum at 56 C, which is a proposed method of reducing exposure risk for laboratory personnel. The IgM levels decreased in all 34 serum samples by mean of 54%. IgG levels decreased in 22 of 34 samples (65%) by a mean of 50%.

Hu et al. (June 28, 2020). Heat Inactivation of Serum Interferes with the Immunoanalysis of Antibodies to SARS-CoV-2. Journal of Clinical Laboratory Analysis. https://doi.org/10.1002/jcla.23411

• [pre-print, not peer-reviewed] A rapid point-of-care diagnostic test (< 20 min) using reverse transcriptase loop-mediated isothermal amplification (RT-LAMP) and semiconductor technology to test extracted RNA samples has 90.6% sensitivity and 100% specificity when compared to RT-qPCR on 183 clinical samples. The portable diagnostic platform is paired with a smartphone for results visualization and geo-localization.

Rodriguez-Manzano et al. (June 30, 2020). A Handheld Point-of-Care System for Rapid Detection of SARS-CoV-2 in under 20 Minutes. Pre-print downloaded Jul 1 from https://doi.org/10.1101/2020.06.29.20142349

• Zhu et al. evaluated the clinical performance of saliva specimens in comparison to paired respiratory tract specimens in a cohort of 442 patients with COVID-19 and positive respiratory tract specimens. RT-PCR testing of saliva specimens had a sensitivity of 86% (95%CI 83%, 89%) and specificity of 97% (95%CI 95, 98%). There was no significant difference regarding the temporal viral load profile between mild and severe cases.

Zhu et al. (June 23, 2020). Viral Dynamics of SARS-CoV-2 in Saliva from Infected Patients. Journal of Infection. https://doi.org/10.1016/j.jinf.2020.06.059

Clinical Characteristics and Health Care Setting

• A large study of patients from the UK (10 hospitals) and Italy (1 hospital) found that a clinical frailty scale was a better predictor of COVID-19 disease outcomes among hospitalized patients than either age or comorbidity. The clinical frailty scale could inform decision making about medical care in adult patients admitted to hospital with COVID-19.

Hewitt et al. (June 30, 2020). The Effect of Frailty on Survival in Patients with COVID-19 (COPE): A Multicentre, European, Observational Cohort Study. The Lancet Public Health. https://doi.org/10.1016/S2468-2667(20)30146-8

• A systematical review and meta-analysis (19 studies, 15,302 COVID-19 cases) shows that adjusted for relevant confounders, hypertension is significantly associated with increased risk of adverse outcomes among COVID-19 patients (OR=1.44; 95% CI 1.24-1.66).

Liang et al. (June 23, 2020). The Association of Hypertension with the Severity and Mortality of COVID-19 Patients: Evidence Based on Adjusted Effect Estimates. Journal of Infection. https://doi.org/10.1016/j.jinf.2020.06.060

• Sanchez et al. found that repeated point prevalence surveys at 26 Detroit skilled nursing facilities (SNFs) identified an attack rate of 44% among SNF residents. Within 21 days of diagnosis, 37% of infected patients were hospitalized and 24% died. Among 12 facilities participating in a second survey and receiving on-site infection prevention and control support, the percentage of newly identified cases decreased from 35% to 18%.

Sanchez et al. (July 1, 2020). Initial and Repeated Point Prevalence Surveys to Inform SARS-CoV-2 Infection Prevention in 26 Skilled Nursing Facilities — Detroit, Michigan, March–May 2020. MMWR. https://doi.org/10.15585/mmwr.mm6927e1

Public Health Policy and Practice

• Based on data from the 2018 Behavioral Risk Factor Surveillance System, 50% of rural residents are at high risk for hospitalization and serious illness if they were to be infected with COVID-19, compared to 47% "micropolitan" and 40% in metropolitan areas.
• Kaufman et al. estimate that rural residents will generate an estimated 10% more hospitalizations for COVID-19 per capita than urban residents given equal infection rates.

Kaufman et al. (June 30, 2020). Half of Rural Residents at High Risk of Serious Illness Due to COVID-19, Creating Stress on Rural Hospitals. The Journal of Rural Health. https://doi.org/10.1111/jrh.12481

OTHER RESOURCES AND COMMENTARIES

- Citywide Nucleic Acid Screening of SARS-CoV-2 Infections in Post-Lockdown Wuhan China Results and Implications – Medrxiv (June 30)
- A Descriptive Study of Coronavirus Disease 2019–Related Experiences and Perspectives of a National Sample of College Students in Spring 2020 – Journal of Adolescent

Health (June 24)

- Social Media Can Have an Impact on How We Manage and Investigate the COVID-19 Pandemic – Journal of Clinical Epidemiology (June 7)
- Structure of the Full SARS-CoV-2 RNA Genome in Infected Cells – Biorxiv (June 30)
- Disproportionate Burden of COVID-19 among Racial Minorities and Those in Congregate Settings among a Large Cohort of People with HIV – AIDS (June 25)
- Could the COVID-19 Pandemic Aggravate Antimicrobial Resistance? – American Journal of Infection Control (June 27)
- A Phenome-Wide Association Study (PheWAS) of COVID-19 Outcomes by Race Using the Electronic Health Records Data in Michigan Medicine – Medrxiv (July 1)
- Is a "Cytokine Storm" Relevant to COVID-19? – JAMA Internal Medicine (June 30)
- Angiotensin-converting Enzyme 2: The Old Door for New Severe Acute Respiratory Syndrome Coronavirus 2 Infection – Reviews in Medical Virology (June 30)
- SARS-CoV-2 Spike Glycoprotein Vaccine Candidate NVX-CoV2373 Elicits Immunogenicity in Baboons and Protection in Mice – Biorxiv (June 30)

The COVID-19 Lit Rep is currently prepared by the UW MetaCenter for Pandemic Preparedness and Global Health Security and the START Center in collaboration with and on behalf of the Washington State Department of Health. The Lit Rep was originally developed and disseminated by the WA DOH COVID-19 Incident Management Team to support evidence-based decision making throughout the region.