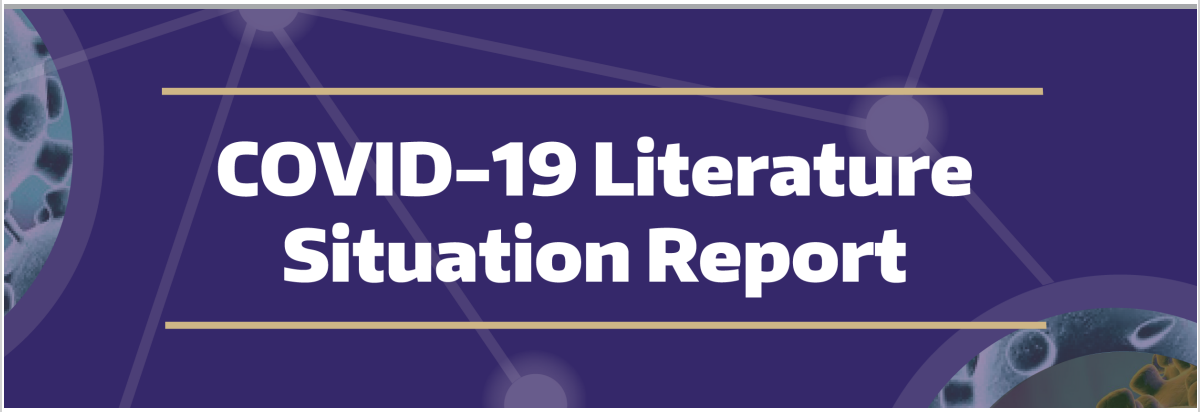
Washington State Department of Health

DEPARTMENT OF GLOBAL HEALTH
UNIVERSITY of WASHINGTON



COVID-19 Literature Situation Report

JUNE 22, 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, and Diana Louden MLib.

Today's summary is based on a review of 1,184 articles (1,039 published, 145 in preprint).

KEY TAKEAWAYS

- **Asymptomatic people with SARS-CoV-2 infection had a longer duration of viral shedding and lower virus-specific IgG levels than a comparison group of people with symptoms, suggesting that they may have a weaker immune response to SARS-CoV-2 infection.** More
- **A risk score based on five indicators (neutrophil count, lymphocyte count, procalcitonin, older age, and C-reactive protein) showed good predictive power for prognosis in COVID-19 patients.** More
- **Increases in depression and anxiety were observed among sexual and gender minority people coinciding with the COVID-19 pandemic onset, indicating a need to support the mental health needs among vulnerable populations.** More

- **75% (108.4 million) of US workers are employed in occupations that are challenging to do from home, including health care, manufacturing, retail, and food services, which also tend to have lower pay.** More

Non-Pharmaceutical Interventions

• A qualitative study using data from Reddit, Twitter, and YouTube comments revealed that people ignore COVID-19-related orders and recommendations of authorities due to many reasons, including information pollution on social media, the persistence of uncertainty about the rapidly spreading virus, the impact of the social environment, and fear of unemployment associated with inequality in the distribution of income.

Ölcer et al. (Dec 19, 2020). Lay Perspectives on Social Distancing and Other Official Recommendations and Regulations in the Time of COVID-19: A Qualitative Study of Social Media Posts. BMC Public Health. https://doi.org/10.1186/s12889-020-09079-5

Transmission

• Kronbichler et al. conducted a meta-analysis with 34 studies that included 506 asymptomatic patients with COVID-19 and reported that 62% had abnormalities visible in computed tomography (CT) scans, with ground glass opacities in the lungs most frequently observed (43%).
• Patients with normal CT results were younger than patients with abnormal CT findings (mean 20 years vs. 39 Years; p = 0.013).

Kronbichler et al. (June 13, 2020). Asymptomatic Patients as a Source of COVID-19 Infections: A Systematic Review and Meta-Analysis. International Journal of Infectious Diseases. https://doi.org/10.1016/j.ijid.2020.06.052

• There was a longer duration of viral shedding among a group of 37 asymptomatic patients with SARS-CoV-2 infection in the Wanzhou District, China, compared to a paired symptomatic group (HR 1.69, 95%CI 1.06, 2.70).
• Asymptomatic individuals had significantly lower virus-specific IgG levels (median 3.4, IQR 1.6-10.7 vs. 20.5, 5.8-38.2; p = 0.005) in the acute phase of infection. Asymptomatic individuals were more likely to have a reduction in neutralizing antibody levels (81% vs. 62%) and to become seronegative (40% vs. 13%) during the early convalescent phase.
• These data suggest that asymptomatic individuals may mount a weaker immune response to SARS-CoV-2 infection, which could have implications for immunity strategies and serological surveys.

Long et al. (June 18, 2020). Clinical and Immunological Assessment of Asymptomatic SARS-CoV-2 Infections. Nature Medicine. https://doi.org/10.1038/s41591-020-0965-6

• [pre-print, not peer reviewed] McNamara et al. demonstrated SARS-CoV-2 evolution in a suburban Southern US region using high-density amplicon sequencing of 175 symptomatic cases. The presence of spike D614G variant, a mutation implicated in higher pathogenicity of the virus, was observed among 57% of strains and was associated with a higher genome copy number ($p<0.002$).
• The single nucleotide variant pattern is consistent with the idea that SARS-CoV-2 was introduced into North Carolina by travelers from the continental US. No strain had mutations in the target sites used in common diagnostic assays.

McNamara et al. (June 19, 2020). High-Density Amplicon Sequencing Identifies Community Spread and Ongoing Evolution of SARS-CoV-2 in the Southern United States. Preprint downloaded June 22 from https://doi.org/10.1101/2020.06.19.161141

• Xu et al. analyzed 643 transmission clusters from 1,407 transmission pairs in mainland China and identified 34 primary cases as super-spreaders and 5 super-spreading events that occurred within households.
• The median duration between symptom onset of primary and secondary cases was 5.0 days (IQR 1.5-8.5) for household transmissions and 5.2 days (1.6-8.8) for non-household transmissions. The risk of being infected outside of households was higher for those age 18 to 64 years, whereas the risk of being infected within households was higher for younger and older people.

Xu et al. (June 18, 2020). Reconstruction of Transmission Pairs for Novel Coronavirus Disease 2019 (COVID-19) in Mainland China: Estimation of Super-Spreading Events, Serial Interval, and Hazard of Infection. Clinical Infectious Diseases. https://doi.org/10.1093/cid/ciaa790

Testing and Treatment

• Cheuk et al. paired 229 posterior oropharyngeal saliva (POPS) samples with same-day nasopharyngeal (NP) samples and reported an overall agreement of 76%, a negative agreement of 65%, and a positive agreement of 76.0%. Better positive agreement was observed for samples obtained within seven days of symptom onset (96.6%) compared to greater than seven days after symptom onset (75.0%).

Cheuk et al. (June 21, 2020). Posterior Oropharyngeal Saliva for the Detection of SARS-CoV-2. Clinical Infectious Diseases. https://doi.org/10.1093/cid/ciaa797

• Etievant et al. compared the performance of five RT-PCR-based methods developed by World Health Organization referral laboratories. Three assays known as N China CDC, N1 US CDC, and RdRp (IP2, IP4) were found to be the most sensitive assays on

based on SARS-CoV-2 cell culture supernatants and clinical respiratory samples. The E Charité and N2 US CDC assays had false-positive results from negative samples and negative controls.

Etievant et al. (June 16, 2020). Performance Assessment of SARS-CoV-2 PCR Assays Developed by WHO Referral Laboratories. Journal of Clinical Medicine. *https://doi.org/10.3390/jcm9061871*

Clinical Characteristics and Health Care Setting

• Piscitello et al. reviewed publicly available guidelines about ventilator allocation for all states and reported that only 26 US states provided adult guidelines and 14 states provided pediatric guidelines. Guidelines differed in their prioritization criteria, with use of the Sequential Organ Failure Assessment score in the initial rank of adult patients in 15 state guidelines (58%) and assessment of limited life expectancy from underlying conditions or comorbidities included in 6 state guidelines.

Piscitello et al. (June 19, 2020). Variation in Ventilator Allocation Guidelines by US State During the Coronavirus Disease 2019 Pandemic. JAMA Network Open. *https://doi.org/10.1001/jamanetworkopen.2020.12606*

• Wu et al. constructed a prognostic signature for COVID-19 composed of five indicators (neutrophil count, lymphocyte count, procalcitonin, older age, and C-reactive protein) among 270 patients with confirmed COVID-19. They showed that the combined predictive ability of the signature surpassed the use of each of the five indicators alone and concluded that it could be used as a risk assessment for closely monitoring patients.

Wu et al. (June 18, 2020). Identification and Validation of a Novel Clinical Signature to Predict the Prognosis in Confirmed COVID-19 Patients. Clinical Infectious Diseases. *https://doi.org/10.1093/cid/ciaa793*

• Wu et al. explored ABO blood group distribution and clinical characteristics in 187 patients with COVID-19 compared to 1,991 controls at the First Hospital of Changsha in China. Data showed that patients with blood group A had an increased risk for COVID-19 (OR=1.54, 95%CI 1.12, 2.10), whereas blood group O was associated with a decreased risk (OR=0.65, 95%CI 0.46, 0.93).

Wu et al. (June 15, 2020). Relationship between ABO Blood Group Distribution and Clinical Characteristics in Patients with COVID-19. Clinica Chimica Acta. *https://doi.org/10.1016/j.cca.2020.06.026*

Mental Health and Personal Impact

• Flentje et al. reported that from June 2019 to March-April 2020, coinciding with the COVID-19 pandemic onset, there were significant increases in depression (as measured by the PHQ-9 tool) and anxiety (as measured by the GAD-7 tool) among a cohort of 2,288 sexual and gender minority people.

Flentje et al. (June 17, 2020). Depression and Anxiety Changes Among Sexual and Gender Minority People Coinciding with Onset of COVID-19 Pandemic. Journal of General Internal Medicine. https://doi.org/10.1007/s11606-020-05970-4

Modeling and Prediction

• Clark et al. used prevalence data from two large multi-morbidity studies and estimated that 1.7 billion (uncertainty interval (UI) 1.0–2.4) people, comprising 22% (UI 15–28) of the global population, have at least one underlying health condition that puts them at increased risk of severe COVID-19. The increased risk was highest in countries with older populations, African countries with high HIV/AIDS prevalence, and small island nations with high diabetes prevalence.

Clark et al. (June 15, 2020). Global, Regional, and National Estimates of the Population at Increased Risk of Severe COVID-19 Due to Underlying Health Conditions in 2020: A Modelling Study. The Lancet Global Health. https://doi.org/10.1016/S2214-109X(20)30264-3

Public Health Policy and Practice

• Baker summarized data from the 2018 US Bureau of Labor Statistics and reported that 75% (108.4 million) of US workers are employed in occupations that are challenging to do from home, including health care, manufacturing, retail, and food services, which also tend to have lower pay. The author concludes that the stress experienced by lower-income groups, coupled with job insecurity, could result in a large burden of mental health disorders in the US in addition to increased cases of COVID-19 from workplace transmission.

Baker. (June 18, 2020). Nonrelocatable Occupations at Increased Risk During Pandemics: United States, 2018. American Journal of Public Health. https://doi.org/10.2105/AJPH.2020.305738

• Lai et al. conducted a population-based, cross-sectional study among 5,325 patients who underwent emergency resuscitation by New York City 911 emergency medical responders. They found that out-of-hospital cardiac arrests and deaths during the COVID-19 pandemic (March 1-April 25, 2020) significantly increased compared with the same period in 2019 (4.75/million vs. 1.59/million), and were associated with older age (mean 72 vs. 68 years), nonwhite race/ethnicity (20% vs. 33%), hypertension (54% vs.

46%), diabetes (36% vs. 26%), and physical limitations (57% vs. 48%).

Lai et al. (June 19, 2020). Characteristics Associated With Out-of-Hospital Cardiac Arrests and Resuscitations During the Novel Coronavirus Disease 2019 Pandemic in New York City. JAMA Cardiology. https://doi.org/10.1001/jamacardio.2020.2488

• The Western WA COVID-19 Expert Panel seeks to identify factors contributing to the effective health system disaster response in western Washington State. Six key themes were identified: (1) Early communication and coordination among stakeholders; (2) Regional coordination of the healthcare system response; (3) Rapid development and access to viral testing; (4) Proactive management of long-term care & skilled nursing facilities; (5) Proactive management of vulnerable populations; (6) Effective physical distancing in the community. Eleven recommendations were provided to support the healthcare system disaster response in managing future outbreaks.

Mitchell et al. (June 8, 2020). Western Washington State COVID-19 Experience: Keys to Flattening the Curve and Effective Health System Response. Journal of the American College of Surgeons. https://doi.org/10.1016/j.jamcollsurg.2020.06.006

OTHER RESOURCES AND COMMENTARIES

- Blueprint for a Pop-up SARS-CoV-2 Testing Lab – Nature Biotechnology (June 18)
- Investigational Therapies for the Treatment of COVID-19: Updates from Ongoing Clinical Trials – European Urology Focus (June 5)
- Why Case Fatality Ratios Can Be Misleading: Individual- and Population-Based Mortality Estimates and Factors Influencing Them – Physical Biology (June 18)
- Observational Study of Metformin and Risk of Mortality in Patients Hospitalized with Covid-19 – Pre-print available on Medrxiv (June 20)
- A Framework for Sustainable Contact Tracing and Exposure Investigation for Large Health Systems – Mayo Clinic Proceedings (June 16)
- The Rise of Adverse Childhood Experiences during the COVID-19 Pandemic – Psychological Trauma (June 18)
- Interferon-β 1a Inhibits SARS-CoV-2 in Vitro When Administered after Virus Infection – The Journal of Infectious Diseases (June 19)
- Are Genetic Vaccines the Right Weapon against COVID-19? – Molecular Therapy (June 10)
- Ethics Lessons From Seattle's Early Experience With COVID-19 – The American Journal of Bioethics (June 18)
- Black–White Risk Differentials in COVID-19 (SARS-COV2) Transmission, Mortality and Case Fatality in the United States: Translational Epidemiologic Perspective and Challenges – International Journal of Environmental Research and Public Health (June 17)

- Comparative Efficacy and Safety of Pharmacological Interventions for the Treatment of COVID-19 A Systematic Review and Network Meta-Analysis of Confounder-Adjusted 20212 Hospitalized Patients – Pre-print available on Medrxiv (June 19)
- Case Isolation, Contact Tracing, and Physical Distancing Are Pillars of COVID-19 Pandemic Control, Not Optional Choices – The Lancet Infectious Diseases (June 16)
- The Epidemiology of SARS-CoV-2 in a Pediatric Healthcare Network in the United States – Journal of the Pediatric Infectious Diseases Society (June 19)
- How to Expedite Early Phase SARS-CoV-2 Vaccine Trials in Pandemic Setting – a Practical Perspective – British Journal of Clinical Pharmacology (June 19)
- COVID-19 and Mental Health Equity in the United States – Social Psychiatry and Psychiatric Epidemiology (June 17)
- Audio Interview: A Look at SARS-CoV-2 Transmission – New England Journal of Medicine (June 18)
- Appropriate Selection of Convalescent Plasma Donors for COVID-19 – The Lancet Infectious Diseases (June 15)
- Global Governance for COVID-19 Vaccines – Lancet (June 20)
- Social Distancing Measures: Evidence of Interruption of Seasonal Influenza Activity and Early Lessons of the SARS-CoV-2 Pandemic – Clinical Infectious Diseases (June 20)
- Vaccines and Therapies in Development for SARS-CoV-2 Infections – Journal of Clinical Medicine (June 16)

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.