



2019-nCoV Literature Situation Report (Lit Rep)

June 18, 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 genome-wide association study identified two separate loci associated with genetic susceptibility to severe COVID-19 disease. One of the loci coincides with the ABO blood group locus. The genetic results found blood group O was associated with lower risk of COVID-19 while blood group A was associated with higher risk of severe disease.** [More](#)
- **Modeling estimates indicate that responding to an outbreak in a jail system with depopulation, single celling, and asymptomatic testing could prevent a large proportion of hospitalizations and deaths among jail staff and prisoners.** [More](#)
- **SARS-CoV-2 infection prevalence was 5.3% among University of Washington Medicine employees who were tested at drive-through rapid testing centers. Frontline healthcare workers and non-frontline staff had similar infection prevalence.** [More](#)
- **Using age-specific mortality patterns across US counties, investigators predict that rural areas may experience a higher per capita burden of disease and healthcare system demand.** [More](#)

Non-Pharmaceutical Interventions

- Kashyap et al. used data from Stanford University medical facilities between March 2 and April 11, 2020 to measure the impact of Shelter-In-Place orders on hospital utilization. They observed a marked slowdown in the hospitalization rate within ten days of Shelter-In-Place orders and a shift toward younger ages among COVID-19 patients. The authors discuss that current published prediction models use case counts that do not account for the demographic distributions of COVID-19 patients and that age stratified local hospitalization rates could improve modeling accuracy to estimate the resource burden on health systems.

Kashyap et al. (June 17, 2020). Measure What Matters: Counts of Hospitalized Patients Are a Better Metric for Health System Capacity Planning for a Reopening. Journal of the American Medical Informatics Association. <https://doi.org/10.1093/jamia/ocaa076>

Transmission

- Patel et al. conducted an outbreak investigation at a skilled nurse facility in Illinois on March 15 and followed 126 residents tested for COVID-19 for 30 days. Of the 33 confirmed cases at the beginning, 58% were symptomatic, 39% remained asymptomatic, and 3% developed symptoms over follow-up. The 30-day probability of death among cases was 29%.

Patel et al. (June 16, 2020). Asymptomatic SARS-CoV-2 Infection and COVID-19 Mortality during an Outbreak Investigation in a Skilled Nursing Facility. Clinical Infectious Diseases.

<https://doi.org/10.1093/cid/ciaa763>



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Testing and Treatment

- *[pre-print, not peer reviewed]* In a partially randomized open-label trial among patients hospitalized with COVID-19 pneumonia (n=85), methylprednisolone was associated with a reduced risk of death, ICU admission, or non-invasive ventilation (RR =0.55, 95% CI: 0.33-0.91).
Corral et al. (June 18, 2020). GLUCOCOVID A Controlled Trial of Methylprednisolone in Adults Hospitalized with COVID-19 Pneumonia. Pre-print downloaded June 18 from <https://doi.org/10.1101/2020.06.17.20133579>
- Lau et al. developed a reverse transcription loop-mediated isothermal amplification (RT-LAMP) assay for rapid detection of SARS-CoV-2. In comparison to the RT-qPCR assay, the investigators reported that the RT-LAMP assay was 2.5 times faster and had a clinical sensitivity and specificity of 100%. However, the RT-LAMP assay had a 5-fold higher limit of detection,
Lau et al. (June 3, 2020). Real-Time Reverse Transcription Loop-Mediated Isothermal Amplification for Rapid Detection of SARS-CoV-2. PeerJ. <https://doi.org/10.7717/peerj.9278>
- Investigators analyzed data on 146 nasopharyngeal (NP) and oropharyngeal (OP) swab pairs collected ≤ 7 days after COVID-19 illness onset and tested them with RT-PCR for SARS-CoV-2 and found diagnostic results were 95.2% concordant. Results also showed that NP swabs could contain more viral material, resulting in lower cycle times, suggestion that NP swabs may have higher sensitivity to detect lower viral concentrations.
Patel et al. (June 16, 2020). Performance of Oropharyngeal Swab Testing Compared to Nasopharyngeal Swab Testing for Diagnosis of COVID-19 —United States, January-February 2020. Clinical Infectious Diseases. <https://doi.org/10.1093/cid/ciaa759>
- *[pre-print, not peer reviewed]* Using a set of 34 serum samples obtained from 26 COVID-19 positive patients with PCR-confirmed SARS-CoV-2 infection, Stroemer et al. compared the diagnostic accuracy of six commercially available antibody tests. Sensitivity ranged from 79.4% (Euroimmun) to 96.2% (Abbott). Based on 100 samples from negative individuals, specificity ranged from 97% (Euroimmun) to 100% (Epitope), with 99% sensitivity for Abbot and Roche tests.
- A high proportion of serum samples demonstrated neutralizing capacity against SARS-CoV-2.
Stroemer et al. (June 17, 2020). Diagnostic Accuracy of Six Commercial SARS-CoV-2 IgGtotal Antibody Assays and Identification of SARS-CoV-2 Neutralizing Antibodies in Convalescent Sera. Pre-print downloaded June 18 from <https://doi.org/10.1101/2020.06.15.20131672>
- *[pre-print, not peer reviewed]* To assess barriers and facilitators to receiving a future COVID-19 vaccine among high-risk individuals, Williams et al. conducted a cross-sectional survey among 527 UK adults (mean age = 59.5) and found that 86% of respondents want to receive a vaccine. Perceiving that COVID-19 will persist for a long time was positively correlated with wanting a vaccine, while perceiving that the media has over-exaggerated the risk had a negative association.
Williams et al. (June 17, 2020). Towards Intervention Development to Increase the Uptake of COVID-19 Vaccination among Those at High Risk Outlining Evidence-Based and Theoretically Informed Future Intervention Content. Pre-print downloaded June 18 from <https://doi.org/10.1101/2020.06.16.20132480>

Clinical Characteristics and Health Care Setting

- A genome-wide association study involving COVID-19 patients (n=1,980) at 7 hospitals in Europe identified two separate loci associated with genetic susceptibility to severe COVID-19 disease.
- One locus on chromosome 3 spans genes 6 genes (SLC6A20, LZTFL1, CCR9, FYCO1, CXCR6 and XCR1), several of which have functions that are potentially relevant to Covid-19.
- A second locus on chromosome 9 coincides with the ABO blood group locus. These genetic results show blood group O is associated with a lower risk of acquiring COVID-19, whereas blood group A is associated with a higher risk of severe COVID-19. These findings are consistent with previous non-genetic studies that have found an association between blood group A and severe COVID-19.

Ellinghaus et al. (June 17, 2020). Genomewide Association Study of Severe Covid-19 with Respiratory Failure. New England Journal of Medicine. <https://doi.org/10.1056/NEJMoa2020283>

- *[pre-print, not peer reviewed]* Analyses of a non-random sample of 5,698 patients tested for COVID-19 in a Michigan health facility reveal that, adjusted for age, sex, and socioeconomic status, non-Hispanic African Americans were 1.7 times more likely to be hospitalized and 1.5 times more likely to enter the ICU. Stratifying by race, analyses found older age, male sex, obesity, and neighborhood density were associated with hospitalization.

Gu et al. (June 18, 2020). COVID-19 Outcomes Risk Factors and Associations by Race a Comprehensive Analysis Using Electronic Health Records Data in Michigan Medicine. Pre-print downloaded June 18 from <https://doi.org/10.1101/2020.06.16.20133140>

- Mani et al. tested 3,477 symptomatic University of Washington Medicine employees between March 12 and April 23 at two high-throughput employee testing centers in Seattle, WA and found a prevalence of 5.3% for SARS-CoV-2 infection. Infection prevalence was similar between frontline healthcare workers (5.2%) and non-frontline staff (5.5%). Six employees reported COVID-19 related hospitalization, and all recovered.

Mani et al. (June 16, 2020). Prevalence of COVID-19 Infection and Outcomes Among Symptomatic Healthcare Workers in Seattle, Washington. Clinical Infectious Diseases. <https://doi.org/10.1093/cid/ciaa761>

Mental Health and Personal Impact

- *[pre-print, not peer reviewed]* Gallagher and Wetherell found that family caregivers had a higher risk of depression than non-caregivers in an analysis using data from a longitudinal UK population-level dataset collected before and during the COVID-19 pandemic. Depression was higher among caregivers both before (17% vs 12%) and during the pandemic (22% vs 18%). Among caregivers, loneliness (measured on a 3-point scale) was associated with a nearly 4-fold higher odds of depression.

Gallagher and Wetherell. (June 17, 2020). Risk of Depression in Family Caregivers Unintended Consequence of COVID-19. Pre-print downloaded June 18 from <https://doi.org/10.1101/2020.06.15.20131532>

Modelling and Prediction

- *[pre-print, not peer reviewed]* Malloy et al. used a stochastic dynamic transmission model to estimate various mitigation strategies in response to a COVID-19 outbreak in a large urban US jail among staff and prisoners. They found that reducing population, single celling, and testing

asymptomatic persons could prevent approximately 83% of projected cases and hospitalizations and 89% of deaths over 83 days.

Malloy et al. (June 18, 2020). *The Effectiveness of Interventions to Reduce COVID-19 Transmission in a Large Urban Jail*. Pre-print downloaded June 18 from <https://doi.org/10.1101/2020.06.16.20133280>

- Miller et al. projected the cumulative disease burden from COVID-19 at the US county level using age-specific mortality patterns and assuming 20% of the population of each county acquires infection. Comparing burden with hospital capacity, the investigators observed that per capita burden of disease and relative healthcare system demand may be higher in rural areas, suggesting the importance of equitable resource allocation to communities outside major urban areas.

Miller et al. (June 16, 2020). *Disease and Healthcare Burden of COVID-19 in the United States*. *Nature Medicine*. <https://doi.org/10.1038/s41591-020-0952-y>

Other Resources and Commentaries

- [Holder Pasteurization Inactivates SARS-CoV-2 in Human Breast Milk](#) – Biorxiv (Jun 17)
- [Why Children Avoid the Worst Coronavirus Complications Might Lie in Their Arteries](#) – Nature (Jun 11)
- [The Nucleocapsid Protein of SARS-CoV-2: A Target for Vaccine Development](#) – Journal of Virology (Jun 16)
- [Religion as a Health Promoter During the 2019/2020 COVID Outbreak: View from Detroit](#) – Journal of Religion and Health (Jun 16)
- [School Nurses on the Front Lines of Healthcare: The Approach to Maintaining Student Health and Wellness During COVID-19 School Closures](#) – NASN School Nurse (Jun 16)
- [Understanding SARS-CoV-2-Related Multisystem Inflammatory Syndrome in Children](#) – Nature Reviews Immunology (Jun 16)
- [Tests, Surgical Masks, Hospital Beds, and Ventilators: Add Big Data to the List of Tools to Fight the Coronavirus That Are in Short Supply](#) – The American Journal of Managed Care (Jun 1)
- [Children and Adolescents in the CoVid-19 Pandemic: Schools and Daycare Centers Are to Be Opened Again without Restrictions. The Protection of Teachers, Educators, Carers and Parents and the General Hygiene Rules Do Not Conflict with This](#) – GMS Hygiene and Infection Control (May 28)

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