

2019-nCoV Literature Situation Report (Lit Rep)

June 12, 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

- **Phylogenetic analyses suggest four genetic clusters are responsible for the major outbreaks of COVID-19 globally.** 😊
- **Early administration of a combination of lopinavir/ritonavir and hydroxychloroquine was not associated with improved clinical outcomes in Italy and was non-significantly associated with higher odds of death by 30-days.** 😊
- **Risk of severe COVID-19 was significantly higher in individuals with asthma among participants in the UK Biobank.** 😊
- **A ranking of the balance between potential transmission risk and social benefit found that dentists, banks, and financial institutions have a high importance-risk balance, while sporting goods stores and gyms have a disproportionately low importance-risk balance.** 😊

Non-Pharmaceutical Interventions

- Zhang et al. analyzed COVID-19 linear trends in the number of COVID-19 cases and fatalities in Wuhan (China), Italy, and the US in relation to the implementation of non-pharmaceutical interventions. The authors interpret their findings as evidence that transmission of SARS-CoV-2 is predominantly airborne (aerosol) and that social distancing will not prevent airborne transmission without face coverings. *[EDITORIAL NOTE: These results should be interpreted with caution. Ecological comparisons and temporal analyses, particularly in the context of dynamic epidemics without comparable control conditions, are limited in their evidence for or against causal effects of population-level interventions.]*

Zhang et al. (June 11, 2020). Identifying Airborne Transmission as the Dominant Route for the Spread of COVID-19. PNAS. <https://doi.org/10.1073/pnas.2009637117>

Transmission

- Sajadi et al. found that 8 cities with substantial community spread of COVID-19 were located along a restricted latitude across different continents, and had consistently similar weather patterns characterized by mean temperature between 5-11°C and low humidity, compared with 42 cities without such spread. This is consistent with the behavior of a seasonal respiratory virus, and points to weather modeling as a possible predictor of high risk of community spread in space and time.

Sajadi et al. (June 11, 2020). Temperature, Humidity, and Latitude Analysis to Estimate Potential Spread and Seasonality of Coronavirus Disease 2019 (COVID-19). JAMA Network Open. <https://doi.org/10.1001/jamanetworkopen.2020.11834>

Geographic Spread

- Phylodynamic analysis of 247 genomic sequences available by early March identified four genetic clusters, defined as super-spreader clusters (SSs), which were found to be responsible for the major outbreaks that followed. Ninety percent of an additional 1,539 genome sequences reported from early March onwards were found to belong to these SSs, with SS4 (responsible for the outbreak in Europe) being the most common (56%).

Yang et al. (Dec 1, 2020). Genetic Cluster Analysis of SARS-CoV-2 and the Identification of Those Responsible for the Major Outbreaks in Various Countries. Emerging Microbes & Infections. <https://doi.org/10.1080/22221751.2020.1773745>

Testing and Treatment

- *[pre-print, not peer reviewed]* Giacomelli et al. studied early (<5 days from onset of symptoms, n=43) vs. delayed (n=129) initiation of lopinavir/ritonavir and hydroxychloroquine (LPV/r + HCQ) on clinical outcomes by analyzing a cohort of patients with COVID-19. All patients meeting the eligibility criteria were offered LPV/r + HCQ. After adjusting for clinical factors, the odds ratio (OR) for 30-day mortality was 1.45 (95%CI 0.50, 4.19). Increase in hepatic enzymes, nausea, and diarrhea were the most common adverse events.

Giacomelli et al. (June 12, 2020). Early Administration of Lopinavir/ritonavir plus Hydroxychloroquine Does Not Alter the Clinical Course of SARS-CoV-2 Infection a Retrospective Cohort Study. Pre-print downloaded June 12 from <https://doi.org/10.1101/2020.06.05.20123299>

- A study of 217 frontline healthcare workers at a German university hospital found 21% suspected they had previously been infected with SARS-CoV-2, but weekly testing for SARS-CoV-2 antibodies identified IgG prevalence 20 days later was 1-2% (assay sensitivity 93.8% and specificity 99%).

Behrens et al. (June 10, 2020). Perceived versus Proven SARS-CoV-2-Specific Immune Responses in Health-Care Professionals. Infection. <https://doi.org/10.1007/s15010-020-01461-0>

Clinical Characteristics and Health Care Setting

- Cen et al. reported clinical outcomes and risk factors from 1,007 patients with mild to moderate COVID-19 in 3 hospitals in Wuhan, China. Over 4 weeks of follow-up, 22% progressed to severe disease, 2% progressed to critical disease, and 4% died. Increasing age, male sex, hypertension, chronic obstructive pulmonary disease, and coronary artery disease were all associated with higher likelihood of progression, while history of smoking was associated with lower risk of progression.

Cen et al. (June 8, 2020). Risk Factors for Disease Progression in Mild to Moderate COVID-19 Patients- a Multi-Center Observational Study. Clinical Microbiology and Infection. <https://doi.org/10.1016/j.cmi.2020.05.041>

- Individuals with asthma (n=65,677) in the UK Biobank had a significantly higher risk of severe COVID-19 (aOR=1.39; 95%CI 1.13-1.71), compared to those without asthma or COPD (n=427,091), after adjusting for confounders. The risk was even greater in those who also had COPD (aOR=1.82; 95%CI 1.16-2.86). On subgroup analysis, this effect was only seen in those with non-allergic asthma.

Zhu et al. (June 6, 2020). Association of Asthma and Its Genetic Predisposition with the Risk of Severe COVID-19. The Journal of Allergy and Clinical Immunology. <https://doi.org/10.1016/j.jaci.2020.06.001>

Mental Health and Personal Impact

- [pre-print, not peer reviewed] Evanoff et al. report that the prevalence of anxiety, depression, and work exhaustion were higher in clinicians than non-clinicians among 5,550 faculty, staff, and post-doctoral fellows surveyed at a university and academic medical center. Community or occupational exposure to COVID-19, lack of support from supervisors, younger age, and family/home stressors were also risk factors for these outcomes among both clinical and non-clinical employees. The authors suggest that supervisor support and prevention of COVID-19 exposure are modifiable risk factors that may improve employee well-being.

Evanoff et al. (June 11, 2020). Work-Related and Personal Factors Associated with Mental Well-Being during COVID-19 Response A Survey of Health Care and Other Workers. Pre-print downloaded June 12 from <https://doi.org/10.1101/2020.06.09.20126722>

- As young adults may have less stability in their careers, education, and social lives than other demographic groups, Alonzi et al. identified young adult subgroups at increased risk for depression and anxiety during the COVID-19 pandemic. They found that gender non-binary participants followed by females and those with pre-existing health conditions reported a higher prevalence of emotional distress.

Alonzi et al. (June 11, 2020). The Psychological Impact of Preexisting Mental and Physical Health Conditions during the COVID-19 Pandemic. Psychological Trauma. <https://doi.org/10.1037/tra0000840>

Public Health Policy and Practice

- Benzell et al. ranked the relative transmission reduction benefit and social costs (including employment costs) of closing 26 categories of public spaces in the US. The authors concluded that banks, dentists, colleges, places of worship, and auto repair shops should be opened before gyms and cafes. Among stores, they found that electronics and furniture stores should be opened before liquor and tobacco stores.
- Banks, general merchandise stores, grocery stores, dentists, and colleges and universities had disproportionately high economic and consumer importance for their level of risk. Cafes, hardware stores, museums, amusement parks, book stores, liquor and tobacco stores, gyms, and sporting goods stores had disproportionately low importance for their level of risk.

Benzell et al. (June 10, 2020). Rationing Social Contact during the COVID-19 Pandemic: Transmission Risk and Social Benefits of US Locations. PNAS.

<https://doi.org/10.1073/pnas.2008025117>

- *A population-based household serosurvey conducted in Geneva, Switzerland found that accounting for test validity (sensitivity and specificity) using Bayesian methods, seroprevalence increased over the first three weeks of the repeated survey (3.8% in week 1, 8.5% in week 2, and 10.9% in week 3).
- Seropositivity was significantly lower among those 5-9 years old (RR=0.32, 95% CI 0.11-0.63) and those over 65 (RR=0.5, 95% CI 0.28-0.78) compared with those 20-49. The authors estimated 11.6 infections for every reported case.

Stringhini et al. (June 2020). Seroprevalence of Anti-SARS-CoV-2 IgG Antibodies in Geneva, Switzerland (SEROCoV-POP): A Population-Based Study. The Lancet.

[https://doi.org/10.1016/S0140-6736\(20\)31304-0](https://doi.org/10.1016/S0140-6736(20)31304-0)

* This study was first included in the Lit Rep as a pre-print on May 7, 2020. Findings are largely unchanged.

- An internet survey of 502 US adults conducted in May 2020 identified knowledge gaps in several areas regarding household cleaning and disinfection, including safe storage of hand sanitizers, cleaners, and disinfectants. Thirty-nine percent reported engaging in high-risk practices in order to prevent SARS-CoV-2 transmission, such as washing food products with bleach, applying products to bare skin, and intentionally inhaling or ingesting products. Public messaging should emphasize safe practices such as hand hygiene and disinfection of high-touch surfaces, while emphasizing avoidance of high-risk practices.

Gharpure et al. (June 12, 2020). Knowledge and Practices Regarding Safe Household Cleaning and Disinfection for COVID-19 Prevention - United States, May 2020.

<https://doi.org/10.15585/mmwr.mm6923e2>

Other Resources and Commentaries

- [“Abandoned” Nursing Homes Continue to Face Critical Supply and Staff Shortages as COVID-19 Toll Has Mounted](#) – JAMA (June 11)
- [Medicaid and COVID-19: At the Center of Both Health and Economic Crises](#) – JAMA (June 11)
- [U.S. ‘Warp Speed’ vaccine effort comes out of the shadows](#) – Science (May 15)
- [Ensuring and Sustaining a Pandemic Workforce](#) – New England Journal of Medicine (June 4)
- [A framework for identifying and mitigating the equity harms of COVID-19 policy interventions](#) – Journal of Clinical Epidemiology (June 2)
- [Case clustering emerges as key pandemic puzzle](#) – Science (May 22)
- [T cells found in coronavirus patients 'bode well' for long-term immunity](#) – Science (May 22)
- [Lessons from the crucible of crisis](#) – Science (May 15)
- [Have deaths from COVID-19 in Europe plateaued due to herd immunity?](#) – The Lancet (June 11)
- [Pandemic could add noise to clinical trial data](#) – Science (May 15)
- [Multi-System Inflammatory Syndrome in Children in Association with COVID-19](#) – Circulation (June 11)
- [Coronavirus R number hides raised risk for minority ethnic groups](#) – Nature (June 10)

Report prepared by the UW MetaCenter 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