



2019-nCoV Literature Situation Report (Lit Rep)

August 5, 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

- **An analysis using SARS-CoV-2 viral cultures found that all culture-positive specimens (16/68) were obtained within the first 8 days after symptom onset, despite RNA detection up to several weeks after symptom onset, suggesting that patients may be less infectious after a period of approximately 8 days.** [More](#)
- **Spread of COVID-19 within Korean schools has been very limited since resuming in-person instruction while following rules for symptom monitoring and distancing among students, and in a setting of low community transmission.** [More](#)
- **Fifteen cases of methanol poisoning, including 4 deaths, associated with ingestion of alcohol-based hand sanitizers were reported in Arizona and New Mexico. An FDA investigation identified and recalled 67 alcohol-based hand sanitizer products that contain methanol.** [More](#)
- **The herd immunity threshold needed to prevent sustained SARS-CoV-2 transmission is estimated to be 73-84%, which would require mass vaccination campaigns multiple times a year if immunity lasted for only one year.** [More](#)

Non-Pharmaceutical interventions

- *[pre-print, not peer reviewed]* Yoon et al. observed no increase in pediatric COVID-19 cases following school re-openings in South Korea. School openings were delayed from March 2020. Instead, online classes began on April 9 and in-person classes started between May 20 to June 8 in four steps by different grades. As of July 11, among the 11,000 students and staff screened for SARS-CoV-2, only 45 children from 40 schools were diagnosed with COVID-19 after in-person classes started, 25 (56%) of whom were presumed to be infected by family members. Notably, as of July 11, only 964 Korean children age ≤19 years had been diagnosed with COVID-19 nationwide, making up around 7% of all diagnoses.

Yoon et al. (Aug 4, 2020). Stepwise School Opening Online and Off-Line and an Impact on the Epidemiology of COVID-19 in the Pediatric Population. Pre-print downloaded on August 5 from <https://doi.org/10.1101/2020.08.03.20165589>



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Transmission

- A correlation analysis of air quality and COVID-19 incidence and mortality in Italy suggested that higher concentrations of fine particulate matter (PM_{2.5}) corresponded temporally with higher COVID-19 incidence, mortality, and case fatality ratios across 110 geographic areas in Northern Italy. The infection rate tripled for PM_{2.5} levels increasing from 10 to 25 µg/m³ and the case fatality doubled for PM_{2.5} levels increasing from 10 to 22 µg/m³.
- The authors propose a potential mechanism for this observation due to upregulation of expression of the ACE-2 gene by pollutants mediated through the aryl hydrocarbon receptor.

Borro et al. (Aug 2, 2020). Evidence-Based Considerations Exploring Relations between SARS-CoV-2 Pandemic and Air Pollution: Involvement of PM_{2.5}-Mediated Up-Regulation of the Viral Receptor ACE-2. International Journal of Environmental Research and Public Health.

<https://doi.org/10.3390/ijerph17155573>

Testing and Treatment

- Landry et al. found that real-time RT-PCR of pure saliva samples had an overall sensitivity for SARS CoV-2 RNA detection of 85.7 % when compared to simultaneously collected nasopharyngeal swab samples.
- More than 33% of the saliva samples were initially too thick or stringy to be pipetted efficiently, requiring an additional sample preparation step before testing. The additional step slowed processing significantly and increased the risk of work-station contamination. Saliva samples requiring this additional step may not be appropriate for high volume testing, which requires ready aspiration by robotic instruments.

Landry et al. (July 31, 2020). Challenges in Use of Saliva for Detection of SARS CoV-2 RNA in Symptomatic Outpatients. Journal of Clinical Virology.

<https://doi.org/10.1016/j.jcv.2020.104567>

- SARS-CoV-2 viral culture data from patients with predominantly mild COVID-19 (n=35) suggests that patients with mild to moderate illness might be less contagious 8 days after symptom onset. Perera et al. found that 16/68 specimens were positive by viral culture, and that all of the positive specimens came from the first 8 days following symptom onset, although participants continued to have detectable viral RNA by PCR for up to 67 days. They conclude that mildly ill patients who have clinically recovered and are not immunocompromised might be discharged from containment >9 days after symptom onset, as long as they are not being discharged into settings that contain other highly vulnerable people.

Perera et al. (Aug 4, 2020). SARS-CoV-2 Virus Culture and Subgenomic RNA for Respiratory Specimens from Patients with Mild Coronavirus Disease. Emerging Infectious Diseases.

<https://doi.org/10.3201/eid2611.203219>

Clinical Characteristics and Health Care Setting

- *[pre-print, not peer reviewed]* An analysis of data from 36 large healthcare systems in 29 U.S. states found a total of 24,516 patients across healthcare settings were diagnosed with COVID-19 between

January 1, 2020, and May 18, 2020. In the same time period, 79,639 were diagnosed with viral pneumonia and 163,984 were diagnosed with influenza.

- Comorbidities were common among COVID-19 patients, including hypertension (32%), arrhythmias (20%) and pulmonary disease (19%). Hydroxychloroquine was used in treatment for 33%, azithromycin for 25%, and tocilizumab for 11% of COVID-19 patients on mechanical ventilators.
- Cross-sectional data were collected from 36 large healthcare systems in 29 U.S. states, participating in PCORnet, the National Patient-Centered Clinical Research Network.

Block et al. (Aug 4, 2020). Characteristics of 24516 Patients Diagnosed with COVID-19 Illness in a National Clinical Research Network Results from PCORnet. Pre-print downloaded on August 5 from <https://doi.org/10.1101/2020.08.01.20163733>

- Thirty-three respirators were decontaminated with a medical autoclave up to three times and tested for loss of structural integrity and ability to filter small particles. FFP-2 respirators performed well: all the samples retained their shape and at least 90% of their filtering capacity after one, two, and three decontaminations, suggesting that they might be successfully used and cleaned repeatedly in primary care settings.

Harskamp et al. (Aug 4, 2020). Reprocessing Filtering Facepiece Respirators in Primary Care Using Medical Autoclave: Prospective, Bench-to-Bedside, Single-Centre Study. BMJ Open. <https://doi.org/10.1136/bmjopen-2020-039454>

- *[pre-print, not peer reviewed]* A systematic review of 64 articles aggregating the experiences of 854 patients suggests an estimated median incubation period (time from exposure to symptom onset) of 4.9 days (95% CI 4.6-5.2). However, including 81 asymptomatic and presymptomatic patients, along with 31 outlier cases with incubation periods exceeding 14 days, Li et al. estimate that people in the 97.5 percentile would experience an incubation period of 19.3 days (95% CI 17.4-21.4), which is longer than the 14-day quarantine period that is typically recommended.

Li. (Aug 4, 2020). The Incubation Period of Severe Acute Respiratory Syndrome Coronavirus 2A Systematic Review. Pre-print downloaded on August 5 from <https://doi.org/10.1101/2020.08.01.20164335>

- Shang et al. investigated the clinical characteristics and outcomes of patients with COVID-19 and diarrhea (157/576 consecutive patients presenting to a hospital) and the correlation between diarrhea and fecal presence of coronavirus. Patients with diarrhea and respiratory symptoms (n=119) had higher levels of the inflammatory markers procalcitonin and ferritin, longer hospital stays, and higher odds of mortality than those with diarrhea alone. Patients with diarrhea and no other symptoms (n=38) had milder illness than those with diarrhea and respiratory symptoms (n=119) or respiratory symptoms without diarrhea. Among a subset of participants with diarrhea (n=36) participants with positive stool RNA had a longer duration of diarrhea than participants with negative stool RNA (median 5 vs. 6 days).

Shang et al. (Aug 4, 2020). Outcomes and Implications of Diarrhea in Patients with SARS-CoV-2 Infection. Scandinavian Journal of Gastroenterology. <https://doi.org/10.1080/00365521.2020.1800078>

Mental Health and Personal Impact

- *[pre-print, not peer reviewed]* Kneale et al. report high levels of stress and depressive symptoms among a sample of 310 LGBTQ+ people during the COVID-19 pandemic, especially among younger,

transgender, and gender-diverse participants. 16.7% of respondents reported some form of harassment due to their LGBTQ+ identity since the start of the pandemic. Stress levels were significantly higher among those who experience harassment and experiences of discrimination during the pandemic partially explained self-reported depression symptoms.

Kneale and Becares. (Aug 4, 2020). The Mental Health and Experiences of Discrimination of LGBTQ+ People during the COVID-19 Pandemic Initial Findings from the Queerantime Study. Pre-print downloaded on August 5 from <https://doi.org/10.1101/2020.08.03.20167403>

- In a qualitative study of home healthcare workers caring for older adults and chronically ill patients in New York City during March and April 2020 (n=33), participants reported that they felt invisible, despite being on the frontlines of the medical response. They also reported a heightened risk for virus transmission; inconsistent information, supplies, and training from their home care agencies; and having to make difficult trade-offs in their work and personal lives.
- Home healthcare workers interviewed were mostly women (97%) and Black (64%) or Hispanic (18%).

Sterling et al. (Aug 4, 2020). Experiences of Home Health Care Workers in New York City During the Coronavirus Disease 2019 Pandemic. JAMA Internal Medicine.

<https://doi.org/10.1001/jamainternmed.2020.3930>

Vaccines

- *[pre-print, not peer reviewed]* Ke et al. estimate that the herd immunity threshold needed to prevent sustained transmission of COVID-19 ranges between 73% and 84%. Based on these estimates and evidence that immunity may not be long-lasting, they suggest the need for repeated waves of vaccination. If mass vaccination achieves 85% immunity that lasts approximately one year, vaccination campaigns will need to occur multiple times a year. Annual vaccination or vaccination every two would be sufficient to maintain herd immunity if the mean duration of individual immunity is 3 years.

Ke et al. (Aug 4, 2020). Estimating the Reproductive Number R_0 of SARS-CoV-2 in the United States and Eight European Countries and Implications for Vaccination. Pre-print downloaded on August 5 from <https://www.medrxiv.org/content/10.1101/2020.07.31.20166298v1>

Public Health Policy and Practice

- Fifteen cases of methanol poisoning associated with ingestion of alcohol-based hand sanitizers were reported in Arizona and New Mexico between May 1 and June 30, 2020. All 15 people were hospitalized, 6 developed seizures, and 9 received hemodialysis or continuous renal replacement therapy. Four of these patients had died as of July 8. An additional three were discharged from the hospital with visual impairment.
- An ongoing FDA investigation identified 67 alcohol-based hand sanitizer products that contain methanol. These products have been recalled.

Yip et al. (Aug 5, 2020). Serious Adverse Health Events, Including Death, Associated with Ingesting Alcohol-Based Hand Sanitizers Containing Methanol — Arizona and New Mexico, May–June 2020. MMWR. Morbidity and Mortality Weekly Report.

<https://doi.org/10.15585/mmwr.mm6932e1>

- Mackey et al. identified 1,271 tweets and 596 Instagram posts marketing fake COVID-19 health products, including unapproved, illegal, and counterfeit testing kits and treatments. Between February and May of 2020, they observed three distinct waves of advertisements for “immunity-boosting” treatments, suspect testing kits, and pharmaceutical products that are not approved for COVID-19 treatment. Each wave followed news coverage about product research and development.

Mackey et al. (May 28, 2020). Big Data, Natural Language Processing, and Deep Learning to Detect and Characterize Illicit COVID-19 Product Sales: An Infoveillance Study on Twitter and Instagram. JMIR Public Health and Surveillance. <https://doi.org/10.2196/20794>

Other Resources and Commentaries

- [The Immune System as a Target for Therapy of SARS-CoV-2: A Systematic Review of the Current Immunotherapies for COVID-19](#) – Life Sciences (Aug 1)
- [Sex Hormones and Novel Corona Virus Infectious Disease \(COVID-19\)](#) – Mayo Clinic Proceedings (May 29)
- [Extreme Vulnerability of Home Care Workers During the COVID-19 Pandemic-A Call to Action](#) – JAMA Internal Medicine (Aug 4)
- [Psychological Distress and Its Correlates Among COVID-19 Survivors During Early Convalescence Across Age Groups](#) – The American Journal of Geriatric Psychiatry (July 10)
- [COVID-19 Control in Low-Income Settings and Displaced Populations: What Can Realistically Be Done?](#) – Conflict and Health (July 31)
- [SARS-CoV-2 Infection Among Symptom-Free Healthcare Workers](#) – Medrxiv (Aug 4)
- [Cross-Sectional Pilot Study Exploring the Feasibility of a Rapid SARS-CoV-2 Immunization Test in Health and Non-Healthcare Workers](#) – Allergy (Aug 5)
- [Application of Social Vulnerability Index to Identify High- Risk Population of Contracting COVID-19 Infection a State-Level Study](#) – Medrxiv (Aug 4)
- [Team Sport in a COVID-19 World. A Catastrophe in Waiting, or an Opportunity for Community Sport to Evolve and Further Enhance Population Health?](#) – British Journal of Sports Medicine (Aug 4)
- [COVID-19 Case Mortality Rates Continue to Decline in Florida](#) – Medrxiv (Aug 4)
- [Fatal Ingestion of Sodium Chlorite Used as Hand Sanitizer during the COVID-19 Pandemic](#) – Clinical Toxicology (Aug 4)
- [COVID-19 and Massive Job Losses Will Test the US Health Insurance Safety Net](#) – JAMA (Aug 4)
- [Potential Treatment Options for COVID-19: A Comprehensive Review of Global Pharmacological Development Efforts](#) – Cureus (June 26)
- [Risk of Hospitalisation with Coronavirus Disease 2019 in Healthcare Workers and Their Households a Nationwide Linkage Cohort Study](#) – Medrxiv (Aug 4)
- [Containing the Spread of Infectious Disease on College Campuses](#) – Medrxiv (Aug 4)
- [Does Vaping Increase Susceptibility to COVID-19?](#) – American Journal of Respiratory and Critical Care Medicine (Aug 4)
- [COVID-19 and the Field of Intellectual and Developmental Disabilities: Where Have We Been? Where Are We? Where Do We Go?](#) – Intellectual and Developmental Disabilities (Aug 4)
- [SARS-CoV-2 \(COVID-19\) Serology: Implications for Clinical Practice, Laboratory Medicine and Public Health](#) – CMAJ (Aug 4)

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



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