



2019-nCoV Literature Situation Report (Lit Rep)

April 10, 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

- ❑ **Research continues on refining and improving current testing capabilities, and one study suggests that self-collected throat washings may present a better SARS-CoV-2 sampling method.**
- ❑ **Multiple studies explore potential protective population level impacts on COVID-19 transmission and severity, including Vitamin D supplementation and BCG vaccination.**
- ❑ **Severe obesity may be a risk factor for severe COVID-19 infection requiring invasive mechanical ventilation (IMV).**
- ❑ **Some risk factors of prolonged viral shedding in COVID-19 patients, include: male sex, delayed admission to hospital after illness onset, and invasive mechanical ventilation.**
- ❑ **More studies are being conducted to understand the association of any meteorological factors with COVID-19 transmission; the current study showing no association of COVID-19 transmission with temperature or UW radiation in Chinese cities.**

Non-Pharmaceutical Interventions

- A cross sectional study of the adult population of Israel conducted to assess public attitudes towards the COVID-19 outbreak and compliance of self-quarantine measures suggests that compliance is much higher when compensation for lost wages is assumed.
- This study indicates that providing people with assurances for their livelihood during self-quarantine is an important component in compliance with public health regulations.

Bodas and Peleg. (Apr 9, 2020). Self-Isolation Compliance In The COVID-19 Era Influenced By Compensation: Findings From A Recent Survey In Israel. Health Affairs.
<https://doi.org/10.1377/hlthaff.2020.00382>

Transmission

- The authors conducted a cross-sectional analysis to examine spatial associations of daily PM2.5 and PM10 concentrations with COVID-19 death rate in China, finding that COVID-19 had higher death rates with increasing concentrations of either PM. This is consistent with past SARS research.

Yao et al. (Apr 10, 2020). Spatial Correlation of Particulate Matter Pollution and Death Rate of COVID-19. Pre-print downloaded Apr 10 from <https://doi.org/10.1101/2020.04.07.20052142>

Geographic Spread

- This MMWR report includes geographic differences in COVID-19 cases, deaths, and changes in incidence in the US, with cumulative incidence ranging widely from 20.6 to 915.3 cases per 100,000 population. These differences likely reflect a combination of jurisdiction-specific epidemiologic and population-level factors, including 1) the timing of COVID-19 introductions; 2) population density; 3) age distribution and prevalence of underlying medical conditions among COVID-19 patients (1–3); 4) the timing and extent of community mitigation measures; 5) diagnostic testing capacity; and 6) public health reporting practices
- The article highlights the importance of monitoring jurisdiction-level numbers of COVID-19 cases, deaths, and changes in incidence to understand community risk and to make decisions about community mitigation, including social distancing, and strategic health care resource allocation.
Bialek et al. (Apr 10, 2020). Geographic Differences in COVID-19 Cases, Deaths, and Incidence — United States, February 12–April 7, 2020. MMWR.
<https://www.cdc.gov/mmwr/volumes/69/wr/pdfs/mm6915e4-H.pdf>
- The authors explored the association between meteorological factors and COVID-19 transmission in 224 Chinese cities. No significant associations were found, suggesting that ambient temperature and UV radiation may not have a significant impact on SARS-CoV-2 transmission.
Yao et al. (Apr 1, 2020). No Association of COVID-19 transmission with temperature or UV radiation in Chinese cities. Eur Respir J. <https://doi.org/10.1183/13993003.00517-2020>

Testing and Treatment

- The authors evaluated a direct RT-QPCR method without RNA extraction and the influence of swab storage media on detection. Their SeeGene's assay provided similar efficiency to RealStar®.
- The authors conclude that RNA extraction may not be necessary if samples are stored in UTM or molecular water; and also recommend that samples be stored in saline solution or Hanks medium.
Merindol et al. (Apr 10, 2020). Optimization of SARS-CoV-2 detection by RT-QPCR without RNA extraction. Pre-print downloaded Apr 10 from <https://doi.org/10.1101/2020.04.06.028902>
- The authors used previously published data on RT-PCR sensitivity of samples derived from nasal swabs to calculate the false negative rate by day since exposure and symptom onset.
- The probability of a false negative test ranged from 100% on day one post exposure to 26% three days after onset symptoms. The authors conclude that in cases of high clinical suspicion, patients should not be ruled out on the bases of RT-PCR alone.
Kucirka et al. (Apr 10, 2020). Variation in False Negative Rate of RT-PCR Based SARS-CoV-2 Tests by Time Since Exposure. Pre-print downloaded Apr 10 from <https://doi.org/10.1101/2020.04.07.20051474>
- SARS-CoV-2 detection was compared in paired self-collected throat washings and nasopharyngeal swabs from 11 patients. The authors conclude that positive testing rate of throat washing was much higher than that of nasopharyngeal swabs, and that throat washing is a promising candidate for 2019-nCoV screening and monitoring due to its noninvasive nature and reliability.
Guo et al. (Apr 9, 2020). Effect of throat washings on detection of 2019 novel coronavirus. Clin Infect Dis. <https://doi.org/10.1093/cid/ciaa416>
- Based on the preliminary analysis of available evidence that supports possible correlation between BCG vaccination and severity of COVID-19 effects at a population level, the author concludes that effectiveness of BCG immunization may depend on the age of administration, with early age inoculation being more effective for lasting protection.

Dolgikh (Apr 7, 2020). Further Evidence of a Possible Correlation Between the Severity of Covid-19 and BCG Immunization. Pre-print downloaded Apr 10 from <https://doi.org/10.1101/2020.04.07.20056994>

Clinical Characteristics and Health Care Setting

- Fox et al report on relevant cardiopulmonary findings from the first series of autopsies in the US on patients who died from COVID-19. These cases identify key pathologic states potentially contributing to severe disease and decompensation in these patients.

Fox et al. (Apr 10, 2020). Pulmonary and Cardiac Pathology in COVID-19: The First Autopsy Series from New Orleans. Pre-print downloaded Apr 10 from <https://doi.org/10.1101/2020.04.06.20050575>

- Data from over 5,000 confirmed COVID-19 cases from 9 countries are analyzed to investigate a potential association between severe Vitamin D deficiency and age-specific case fatality.
- The study find that countries with lower Vitamin D levels had higher age-specific case fatality, suggesting that proper Vitamin D supplementation may reduce the number of severe COVID-19 cases by up to 15%.

Daneshkhah et al. (Apr 10, 2020). The Role of Vitamin D in Suppressing Cytokine Storm in COVID-19 Patients and Associated Mortality. Pre-print downloaded Apr 10 from <https://doi.org/10.1101/2020.04.08.20058578>

- The authors analyzed the relationship between clinical characteristics and the need for invasive mechanical ventilation (IMV) in this retrospective cohort study of 124 patients in France.
- The study showed a high frequency of obesity among patients admitted to intensive care (48%). The need for IMV was associated with male sex and increased BMI, and the odds ratio for IMV in severely obese patients was 7.36 when compared with normal-weight patients.

Simonnet et al. (Apr 9, 2020). High prevalence of obesity in severe acute respiratory syndrome coronavirus-2 (SARS-CoV-2) requiring invasive mechanical ventilation. Obesity. <https://doi.org/10.1002/oby.22831>

- This retrospective study of 113 patients identified risk factors of prolonged viral shedding in COVID-19 patients, including: male sex, delayed admission to hospital after illness onset, and invasive mechanical ventilation.

Xu et al. (Apr 9, 2020). Factors associated with prolonged viral RNA shedding in patients with COVID-19. Clin Infect Dis. <https://doi.org/10.1093/cid/ciaa351>

- Zhao et al report on a COVID-19 case with HIV-1 and HCV co-infection. The case showed persistently negative SARS-CoV-2 RNA tests, but had a delayed antibody response in the plasma, highlighting the influence of HIV-1 induced immunosuppression on early SARS-CoV-2 clearance.

Zhao et al. (Apr 9, 2020). Early virus clearance and delayed antibody response in a case of COVID-19 with a history of co-infection with HIV-1 and HCV. Clin Infect Dis. <https://doi.org/10.1093/cid/ciaa408>

- The authors review CT images and clinical findings from 23 hospitalized pregnant COVID-19 patients (15 asymptomatic, 8 symptomatic). Clinical characteristics and radiological findings in pregnant women with COVID 19 were similar to those of non-pregnant women with COVID-19, and a correlation between clinical and radiological characteristics was observed in this study.

Wu et al. (Apr 8, 2020). Radiological findings and clinical characteristics of pregnant women with COVID 19 pneumonia. Int J Gynaecol Obstet. <https://doi.org/10.1002/ijgo.13165>

Public Health Policy and Practice

- A cross-sectional survey of 630 U.S. adults living with at least one chronic condition evaluated COVID-19 awareness, knowledge, attitudes, and related behaviors.
- Participants who were black, were living below the poverty level, and had low health literacy were more likely to be less worried about COVID-19, to not believe that they would become infected, and to feel less prepared for an outbreak. Those with low health literacy had greater confidence in the federal government response. Many adults with comorbid conditions lacked critical knowledge about COVID-19 and, despite concern, were not changing routines or plans.

Wolf et al. (Apr 9, 2020). Awareness, Attitudes, and Actions Related to COVID-19 Among Adults With Chronic Conditions at the Onset of the U.S. Outbreak. Annals Intern Med.

<https://doi.org/10.7326/M20-1239>

Other Resources and Commentaries

- [COVID-19 and the gastrointestinal tract: more than meets the eye](#) – Gut (Mar 27)
- [Interim Guidance for Basic and Advanced Life Support in Adults, Children, and Neonates With Suspected or Confirmed COVID-19](#) – Circulation AHA (Apr 9)
- [ACE-2 Expression in the Small Airway Epithelia of Smokers and COPD Patients: Implications for COVID-19](#) – Euro Respir J (Apr 10)