



2019-nCoV Literature Situation Report (Lit Rep)

March 2, 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

- ❑ **Descriptive studies of fatal COVID-19 cases continue to converge on key factors that appear to be associated with an elevated risk of death: older age, male sex, and comorbidities (e.g., hypertension, heart disease, and diabetes).**
- ❑ **The effectiveness of contact tracing, quarantine, and isolation requires further review as more studies continue to explore the contextual epidemic factors that may influence how well these processes can limit the spread of COVID-19.**
- ❑ **Development and testing of new diagnostic and prognostic tools that use machine learning and deep learning computer models are producing promising results for sensitive, specific, and cost-effective methods.**
- ❑ **China CDC has reported detailed recommendations on disinfection practices for SARS-CoV-2 for use across a range of settings and items.**

Non-Pharmaceutical Interventions

- Non-Hubei COVID-19 cases in China were assessed to estimate generation time, incubation period, and time from symptom onset to isolation and diagnosis. While the current standard is a 14-day quarantine, this study suggests that this may be insufficient. The authors recommend a 22-day quarantine period. They also estimate that patients may become infectious on average 3.9 days prior to major symptoms, limiting the effectiveness of contact tracing and quarantine efforts.
Li et al. (March 1, 2020). Transmission characteristics of the COVID-19 outbreak in China: a study driven by data. Pre-print downloaded Mar 2 from <https://doi.org/10.1101/2020.02.26.20028431>
- China CDC has published their recommended disinfection processes for SARS-CoV-2.
Wang et al. (Feb 28, 2020). Key Points of the Program for Disinfection Technology in Special Places During the Coronavirus Disease-2019 (COVID-19) Outbreak. China CDC Weekly. <http://weekly.chinacdc.cn/en/article/id/9a7c7cbe-1419-401a-b2eb-dcae9d832e0f>
- Saudia Arabia has placed restrictions on Umrah pilgrimage travelers to curb the spread of COVID-19. Umrah is considered smaller than the Hajj pilgrimage, but Umrah travelers tend to fly commercially and do not receive the same health education resources as Hajj pilgrims. Other factors increasing risk among Umrah pilgrims are described.

Ebrahim et al. (Feb 28, 2020). Saudi Arabia's measures to curb the COVID-19 outbreak: temporary suspension of the Umrah pilgrimage. *J Travel Med.*

<https://doi.org/10.1093/jtm/taaa029>

- Modelling of disease transmission on the Diamond Princess cruise ship offers insight into the effectiveness of non-pharmaceutical interventions in reducing COVID-19 transmission. Removing ill passengers and quarantining all others may have reduced the incidence of COVID-19 from 79% to 17%, translating to roughly 2,307 prevented cases by Feb 19. However, modelling also indicates that earlier evacuation of crew and passengers would have prevented even more cases. Conclusions may be transferrable to similarly dense and confined populations.

Rocklöv et al. (Feb 28, 2020). COVID-19 outbreak on the Diamond Princess cruise ship: estimating the epidemic potential and effectiveness of public health countermeasures. *J Travel Med.*

<https://doi.org/10.1093/jtm/taaa030>

Testing and Treatment

- A new machine learning prognostic model was found to have 90% accuracy in predicting mortality among COVID-19 patients based on just three clinical characteristics: lactic dehydrogenase (LDH), lymphocyte and high-sensitivity C-reactive protein (hsCRP).

Yan et al. (Mar 1, 2020). Prediction of survival for severe Covid-19 patients with three clinical features: development of a machine learning-based prognostic model with clinical data in Wuhan. Pre-print downloaded Mar 2 from <https://doi.org/10.1101/2020.02.27.20028027>

- A new deep learning-based system was found to have 100% sensitivity and 93.55% specificity (PPV 84.62%) in detecting COVID-19 from CT scans. The model performed comparably to an expert radiologist, and combined with expert review the model decreased CT reading time by 65%.

Chen et al. (Mar 1, 2020). Deep learning-based model for detecting 2019 novel coronavirus pneumonia on high-resolution computed tomography: a prospective study. Pre-print downloaded Mar 2 from <https://doi.org/10.1101/2020.02.25.20021568>

- Xiang et al present sensitivity and specificity of ELISA and GICA IgM and IgG serological assays for COVID-19 detection, noting that these tests may be useful alternatives to current PCR-based methods.

Xiang et al. (March 1, 2020). Evaluation of Enzyme-Linked Immunoassay and Colloidal Gold-Immuno-chromatographic Assay Kit for Detection of Novel Coronavirus (SARS-Cov-2) Causing an Outbreak of Pneumonia (COVID-19). Pre-print downloaded Mar 2 from

<https://doi.org/10.1101/2020.02.27.20028787>

- An asymptomatic 6-month old infant was hospitalized with COVID-19 and had positive nasopharyngeal swabs 16 days after admission. The case highlights potential flaws in current symptom-centric case definitions, especially in infants.

Kam et al. (Feb 28, 2020). A Well Infant with Coronavirus Disease 2019 (COVID-19) with High Viral Load. *Clin Infect Dis.* <https://doi.org/10.1093/cid/ciaa201>

- Zhang et al summarize clinical trials for potential COVID-19 treatment options.

Zhang et al. (Feb 28, 2020) Clinical trial analysis of 2019-nCoV therapy registered in China. *J Med Virol.* <https://doi.org/10.1002/jmv.25733>

Clinical Characteristics and Health Care Setting

- 48 confirmed and suspected COVID-19 patients who underwent home isolation without hospitalization in China were monitored via an online platform for symptoms. The authors conclude that frequent laboratory samples and physical examination are not necessary for monitoring patients with mild symptoms.

Xu et al. (Feb 29, 2020). Evaluation of the clinical characteristics of suspected or confirmed cases of COVID-19 during home care with isolation: A new retrospective analysis based on O2O. Pre-print downloaded Feb 29 from <https://doi.org/10.1101/2020.02.26.20028084>

- A case series of 36 COVID-19 fatalities yields similar findings to prior research indicating that males with comorbidities are commonly among those who die of the disease. Median time from symptom onset to acute respiratory distress syndrome among these deaths was 11 days, while gradually decreasing lymphocytes and increased inflammation biomarkers were also common.

Huang et al. (Feb 29, 2020). Clinical characteristics of 36 non-survivors with COVID-19 in Wuhan, China. Pre-print downloaded Feb 29 from <https://doi.org/10.1101/2020.02.27.20029009>

- COVID-19 patients who present with signs of heart injury during the course of their illness may be at higher risk of death than other patients and should be managed carefully.

Wu et al. (Feb 29, 2020). Heart injury signs are associated with higher and earlier mortality in coronavirus disease 2019 (COVID-19). Pre-print downloaded Feb 29 from <https://doi.org/10.1101/2020.02.26.20028589>

- The establishment of makeshift hospitals and rising ambient temperatures appear associated with improved survival among COVID-19 patients in Hubei.

Cai et al. (Feb 29, 2020). Effects of "Fangcang, Huoshenshan, and Leishenshan" Makeshift Hospitals and Temperature on the Mortality of COVID-19. Pre-print downloaded Feb 29 from <https://doi.org/10.1101/2020.02.26.20028472>

- Authors describe a case series of 10 pediatric COVID-19 patients in China. Epidemiologic characteristics of each case, including potential sources of infection, and detailed clinical features are provided. While symptoms were generally mild, prolonged viral shedding was observed in respiratory and fecal samples.

Jiehao et al. (Feb 28, 2020) A Case Series of children with 2019 novel coronavirus infection: clinical and epidemiological features. Clin Infect Dis. <https://doi.org/10.1093/cid/ciaa198>

- Another study examining the neurological effects of COVID-19 suggests that these may be partially responsible for respiratory failure among patients.

Li et al. (Feb 27, 2020). The neuroinvasive potential of SARS-CoV2 may be at least partially responsible for the respiratory failure of COVID-19 patients. J Med Virol. <https://doi.org/10.1002/jmv.25728>

- With concerns around asymptomatic transmission, authors offer recommendations for blood safety in areas with known spread. They also provide inactivation methods for coronaviruses in blood products and laboratory tissue culture.

Chang et al. (Feb 21, 2020) Coronavirus Disease 2019: Coronaviruses and Blood Safety. Transfusion Medicine Review 29, 203s. <https://doi.org/10.1016/j.tmr.2020.02.003>

Other Resources and Commentaries

- [COVID-19 — New Insights on a Rapidly Changing Epidemic](#) – JAMA (Feb 28)
- [COVID-19 — Navigating the Uncharted](#) – NEJM (Feb 28)
- [Responding to COVID-19 — A Once-in-a-Century Pandemic?](#) – NEJM (Feb 28)
- [Occupational risks for COVID-19](#) – Occupational Medicine (Feb 28)
- [COVID-19: Lessons from SARS and MERS](#) – European Journal of Immunology (Feb 27)
- [Coronavirus Disease 2019 and Influenza](#) – JAMA Infographic (Feb 26)
- [Characteristics of and Important Lessons From the Coronavirus Disease 2019 \(COVID-19\) Outbreak in China](#) – JAMA (Feb 24)