



2019-nCoV Literature Situation Report (Lit Rep) March 20, 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

- 📄 **Results from a meta-analysis highlight the importance of timely and clear communication by public health officials for better quarantine adherence.**
- 📄 **Results from a cohort study suggest that continuous renal replacement therapy (CRRT) may prolong survival in COVID-19 patients receiving mechanical ventilation.**
- 📄 **A new study shares a deep learning AI model that was developed to detect and differentiate COVID-19 from community-acquired pneumonia and other lung diseases using chest CT scans.**
- 📄 **A quick survey was developed to understand COVID-19 transmission by geographical proximity.**

Non-Pharmaceutical Interventions

- This review on adherence to quarantine found that adherence ranged from 0 to 93%. The most common factors affecting adherence were knowledge about the COVID-19 outbreak, quarantine protocol, social norms, perceived benefits of quarantine and perceived risk of contracting COVID-19 and practicalities of being in quarantine.
- This highlights the importance of timely and clear communication on quarantine rationale and protocol by public health officials and ensuring that sufficient supplies (i.e. food, medications) are available.

Webster et al. (March 20, 2020). How to improve adherence with quarantine: Rapid review of the evidence. Pre-print downloaded Mar 20 from <https://doi.org/10.1101/2020.03.17.20037408>

Transmission

- Lu et al use results from a single family cluster of asymptomatic COVID-19 patients in China to infer that comprehensive and rigorous epidemiological investigation in combination with multiple detection methods can help in the detection of hidden asymptomatic carriers.

*Lu et al. (March 19, 2020). Alert for non-respiratory symptoms of Coronavirus Disease 2019 patients in epidemic period: A case report of familial cluster with three asymptomatic COVID-19 patients. *Journ of Medical Virology*. <https://doi.org/10.1002/jmv.25776>*

- A stochastic transmission model used to predict the spread of COVID-19 and assess the effectiveness of transmission control measures in crowded areas in Japan found that the growth of infected

people stagnated if time spent in crowded areas was less than 4 hours and started to decrease if cut to 2 hours.

Karako et al. (March 19, 2020). Analysis of COVID-19 infection spread in Japan based on stochastic transition model. BioScience Trends. <https://doi.org/10.5582/bst.2020.01482>

Geographic Spread

- Rossman et al developed a short survey based on symptoms associated with COVID-19, with the primary purpose of locating potential geographic areas in which SARS-CoV-2 is spreading throughout Israel. Preliminary results reveal different rates of symptoms in different cities despite close geographical proximity.
- This survey may have several potential applications - (1) help predict future spreading zones a few days before an outbreak occurs, (2) evaluate the effectiveness of public health prevention strategies (i.e. social distancing) and, (3) aid in understanding the clinical course of COVID-19 by tracking the dynamics of symptoms over time.

Rossman et al. (March 19, 2020). A framework for identifying regional outbreak and spread of COVID-19 from one-minute population-wide surveys. Pre-print downloaded Mar 20 from <https://doi.org/10.1101/2020.03.19.20038844>

Testing and Treatment

- This cohort study of 36 COVID-19 patients with invasive mechanical ventilation, some of whom received continuous renal replacement therapy (CRRT), found that CRRT was independently associated with a reduced risk of mortality in these patients.
- The authors state that further studies with larger sample sizes are needed.

Yang et al. (March 16, 2020). Effect of continuous renal replacement therapy on all-cause mortality in COVID-19 patients undergoing invasive mechanical ventilation: a retrospective cohort study. Pre-print downloaded Mar 20 from <https://doi.org/10.1101/2020.03.16.20036780>

- The researchers used data from 4,356 chest CT exams from 3,322 patients to develop a deep learning model that can accurately detect COVID-19 and differentiate it from community acquired pneumonia and other lung diseases.

Li et al. (March 19, 2020). Artificial Intelligence Distinguishes COVID-19 from Community Acquired Pneumonia on Chest CT. Radiology. <https://doi.org/10.1148/radiol.2020200905>

Clinical Characteristics and Health Care Setting

- Du et al use influenza and COVID-19 surveillance data from hospitals in Wuhan to estimate cumulative pediatric COVID-19 hospitalizations prior to the Jan 23 lockdown. Their estimate of 1,105 cases far surpasses the 425 confirmed cases across all age groups, none of which were children under age 15.
- This suggests there may be significantly more mild cases in children than known, and highlights the need for more robust surveillance to capture the severity and extent of COVID-19 cases across all ages.

Du et al. (March 16, 2020). Hundreds of severe pediatric COVID-19 infections in Wuhan prior to the lockdown. Pre-print downloaded Mar 20 from <https://doi.org/10.1101/2020.03.16.20037176>

- This is the first evidence-based research exploring risk factors of prognosis in patients with COVID-19, which is helpful to identify early-stage patients with poor prognosis and adapt treatment.

- Predictors of COVID-19 severity and mortality in this study were: age (50+), sex (male) and presence of comorbidity such as hypertension, diabetes, cancer and respiratory disease. Additionally, a longer time observed from symptoms to hospitalization was correlated with increased mortality underlining the importance of timely medical treatment.

Ma et al. (March 17, 2020). COVID-19: Incidence, clinical characteristics and prognostic factors of patients with COVID-19: a systematic review and meta-analysis. Pre-print downloaded Mar 20 from <https://doi.org/10.1101/2020.03.17.20037572>

- The author discusses how SARS and MERS affected sexual and reproductive health and rights in different parts of the world, and argues the role principles of human rights should play in ensuring availability, accessibility and quality of medical services. Pregnant women with COVID-19 respiratory illness should be treated with priority because of the risk of complications.

Hussein (March 19, 2020). COVID-19: What implications for sexual and reproductive health and rights globally? Journ of Sexual and Repro Health Matters. <https://doi.org/10.1080/26410397.2020.1746065>

Modelling and Prediction

- Results from this modelling study suggests that warmer weather in the northern hemisphere may only have a moderate effect on the rate of spread of COVID-19, emphasizing the need for further scaling up of containment measures.

Bannister-Tyrrell et al. (March 18, 2020). Preliminary evidence that higher temperatures are associated with lower incidence of COVID-19, for cases reported globally up to 29 February 2020. Pre-print downloaded Mar 20 from <https://doi.org/10.1101/2020.03.18.20036731>

Public Health Policy and Practice

- Zhao and Xu suggest that social media can aid government and health agencies in creating targeted prevention and control measures for COVID-19.

Zhao and Xu (March 18, 2020). Chinese Public Attention to COVID-19 Epidemic: Based on Social Media. Pre-print downloaded Mar 20 from <https://doi.org/10.1101/2020.03.18.20038026>

Other Resources and Commentaries

- [Protecting Health Care Workers Against COVID-19—And Being Prepared for Future Pandemics](#)—Jama Health Forum (Mar 19)
 - The authors discuss the struggle in the US to protect HCWs and provide several recommendations to ensure adequate supply of PPE and improve emergency preparedness in the event of a future pandemic.
- [Securing the Safety Net and Protecting Public Health During a Pandemic--Medicaid's Response to COVID-19](#)—JAMA (Mar 19)
 - The authors suggest actions that Medicaid could take to address gaps in health care services amidst the COVID-19 pandemic, such as expand telehealth and home-based care, increase enrollment and expand capabilities, and ease limits on prescription drug and long-term services.
- [Characteristics and Outcomes of 21 Critically Ill Patients With COVID19 in Washington State](#)—JAMA (Mar 19)