



## 2019-nCoV Literature Situation Report (Lit Rep)

April 16, 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

- 📄 **Studies to determine efficacy of therapeutic treatments continue- one suggesting that convalescent plasma may be effective and specific for COVID-19, while another suggesting that RAS inhibitors could improve clinical outcomes of COVID-19 patients with hypertension.**
- 📄 **COPD and ongoing smoking history attribute to the worse progression and outcomes of COVID-19.**
- 📄 **Estimates of cumulative infection from a Kaiser Permanente study suggest that the western U.S. remains far from reaching a herd immunity threshold, and that hospitals should continue to ensure capacity to manage COVID-19 cases in a manner than is responsive to changes in social distancing or other pandemic-mitigating measures.**
- 📄 **Fever, fatigue, cough and expectoration appear to be the most commonly experienced symptoms in a new meta-analysis study.**

### Non-Pharmaceutical Interventions

- Using a simplified SIR model to investigate the effects of near-universal mask use on COVID-19, the authors state that mask use had a relatively minor benefit on critical-care and mortality rates when transmissibility was high. However, when the RE approached 1 (as might be expected after aggressive social-distancing measures), the model finds a significant reduction in deaths.
- The study suggests that when home-confinement is lifted but other social measures like school closure and social isolation are still in place, wearing masks can maintain the benefits of home-confinement – both in terms of deaths and critical-care bed use.

*Javid & Balaban (Apr 16, 2020). Impact of population mask wearing on Covid-19 post lockdown.*

*Pre-print downloaded Apr 16 from <https://doi.org/10.1101/2020.04.13.20063529>*

### Geographic Spread

- The authors use prospective space-time scan statistic methodology to detect emerging clusters of COVID-19 in the US and at the county level for 2 distinct time periods, and emphasize the importance of focusing surveillance on emerging and active clusters during epidemics.
- These timely results can inform public health officials and decision-makers about locations to prioritize for targeted interventions, resource allocation, rapid testing, and for implementation of stricter quarantines and travel bans.

Desjardins et al. (Apr 2020). Rapid surveillance of COVID-19 in the United States using a prospective space-time scan statistic: Detecting and evaluating emerging clusters. *Applied Geography*. <https://doi.org/10.1016/j.apgeog.2020.102202>

## Testing and Treatment

- Results from a cohort study across 5 Eastern Massachusetts hospitals suggest that electronic health records may complement efforts to identify novel therapeutics for COVID-19 by identifying FDA-approved compounds with potential benefit in reducing COVID-19 associated morbidity.
- Preliminary findings based on a comparison of ranked electronic prescribing frequencies indicate that medications enriched among test-positive individuals not requiring hospitalization included ibuprofen, valacyclovir, and naproxen.

Castro et al. (Apr 16, 2020). Brief Report: Identifying common pharmacotherapies associated with reduced COVID-19 morbidity using electronic health records. Pre-print downloaded Apr 16 from <https://doi.org/10.1101/2020.04.11.20061994>

- This descriptive study, on 6 patients who received the transfusion of ABO-compatible convalescent plasma (CP) to evaluate the efficacy of CP therapy, indicates that CP therapy is effective and specific for COVID-19. The efficacy of this intervention was determined by the alleviation of symptoms, changes in radiologic abnormalities and laboratory tests.

Ye et al. (Apr 15, 2020). Treatment with convalescent plasma for COVID-19 patients in Wuhan, China. *Jour of Med Virol*. <https://doi.org/10.1002/jmv.25882>

- This study demonstrates that renin-angiotensin system (RAS) inhibitors improve the clinical outcomes of COVID-19 patients with hypertension, suggesting that these patients could benefit from the persistent or preferential usage of angiotensin-converting enzyme inhibitors (ACEIs) and angiotensin II type 1 receptor blockers (ARBs) for antihypertensive treatment.

Meng et al. (Mar 31, 2020). Renin-angiotensin system inhibitors improve the clinical outcomes of COVID-19 patients with hypertension. *Emerg Micro & Infect*.

<https://doi.org/10.1080/22221751.2020.1746200>

## Clinical Characteristics and Health Care Setting

- In a systematic review and meta-analysis of 16 papers including 3,473 patients, Shamshirian et al find that acute cardiac injury, hypertension, heart failure and overall cardiovascular diseases were significantly associated with mortality and disease severity in COVID-19 patients.
- COVID-19 patients need to be carefully monitored for CVD and managed properly in case of acute cardiac conditions.

Shamshirian et al. (Apr 16, 2020). Cardiovascular Diseases and COVID-19 Mortality and Intensive Care Unit Admission: A Systematic Review and Meta-analysis. Pre-print downloaded Apr 16 from

<https://doi.org/10.1101/2020.04.12.20062869>

- This study of 1,277 hospitalized, COVID-19 patients who resided in CA or WA and had Kaiser Permanente insurance identified these key characteristics: (1) older and male patients were more likely than younger or female patients to be admitted to the ICU and to die, (2) an 11-day average duration of stay for hospitalized patients and (3) a 14-day average duration of stay among non-survivors.
- The authors also looked at transmission dynamics and found that the effective reproduction number ( $R_e$ ) declined in conjunction with implementation of non-pharmaceutical interventions.

- Estimates of cumulative infection suggest that the western U.S. remains far from reaching a herd immunity threshold, and that hospitals should continue to ensure capacity to manage COVID-19 cases in a manner than is responsive to changes in social distancing or other pandemic-mitigating measures.

*Lewnard et al. (Apr 16, 2020). Incidence, clinical outcomes, and transmission dynamics of hospitalized 2019 coronavirus disease among 9,596,321 individuals residing in California and Washington, United States: a prospective cohort study. Pre-print downloaded Apr 16 from <https://doi.org/10.1101/2020.04.12.20062943>*

- A meta-analysis of clinical characteristics of 3,062 COVID-19 patients suggest that fever, fatigue, cough and expectoration were the most commonly experienced symptoms of COVID-19 patients. A relatively small percentage of patients were asymptomatic. Most patients showed normal leucocytes counts, lymphopenia, elevated levels of C-reactive protein and ESR. Bilateral lungs involvement was common.

*Zhu et al. (Apr 15, 2020). Clinical characteristics of 3,062 COVID-19 patients: a meta-analysis. Jour of Med Virology. <https://doi.org/10.1002/jmv.25884>*

- A comprehensive systematic literature search to explore the risk of COVID-19 in patients with pre-existing chronic obstructive pulmonary disease (COPD) and ongoing smoking history indicates that COPD and ongoing smoking attribute to the worse progression and outcomes of COVID-19.

*Zhao et al. (Apr 15, 2020). The impact of COPD and smoking history on the severity of Covid-19: A systemic review and meta-analysis. Jour of Med Virol. <https://doi.org/10.1002/jmv.25889>*

## Modelling and Prediction

- Ranjan presents results from three epidemiological models (logistic, SIR and generalized SIER) that were used to make predictions for the final epidemic size of COVID-19 for the most affected countries, indicating that the final epidemic size in the US, Italy, Spain, and Germany could be 1.1, 0.22, 0.24 and 0.19 million respectively.
- The model also predicts that curves for most of the geographical regions will flatten by the middle of May 2020.

*Ranjan (Apr 16, 2020). Estimating the final epidemic size for COVID-19 outbreak using improved epidemiological models. Pre-print downloaded Apr 16 from <https://doi.org/10.1101/2020.04.12.20061002>*

## Public Health Policy and Practice

- From a meta-analysis of 12 published papers with a total of 9,025 COVID-19 patients, this study identifies smoking as a risk factor for progression of COVID-19. Smokers had significantly higher odds (OR=2.25) of COVID-19 progression than never smokers.
- Physicians and public health professionals should collect data on smoking and e-cigarette use as part of clinical management and add smoking cessation to the list of practices to curb the COVID-19 pandemic.

*Patanavanich & Glantz (Apr 16, 2020). Smoking is Associated with COVID-19 Progression: A Meta-Analysis. Pre-print downloaded Apr 16 from <https://doi.org/10.1101/2020.04.13.20063669>*

## Other Resources and Commentaries

- [COVID-19 and African Americans](#) – JAMA (Apr 15)

- Based on data from Johns Hopkins University and ACS, the author finds that of the 131 predominantly black counties in the US, the infection rate is more than 3-fold higher and the death rate is more than 6-fold higher than in predominantly white counties. Yancy emphasizes that now is the time to address health care disparities along.
- [COVID-19 in patients with HIV: clinical case series](#) – Lancet HIV (Apr 15)
  - A single-center experience from a Barcelona hospital of 5 COVID-19 patients infected with HIV-1, including clinical characteristics, antiviral and antiretroviral treatment and patient outcomes, is presented in detail in this correspondence.
- [COVID-19 and the coming epidemic in US immigration detention centres](#) – Lancet Infect Dis (Apr 15)
  - Due to existing barriers of mitigation, containment, and provision of medical care in detention facilities, this article suggests that the policy response to COVID-19 must involve the release of individuals in ICE detention and a halt of ICE enforcement action in the community.
- [Current knowledge about the antivirals remdesivir \(GS-5734\) and GS-441524 as therapeutic options for coronaviruses](#) – One Health (Mar 24)
- [Exhaled breath condensate as a potential specimen for diagnosing COVID-19](#) – Bioanalysis (Apr 15)
  - The authors propose that exhaled breath condensate (EBC) samples should be tested as a noninvasive sampling method in clinics because EBC seems to be a promising specimen for COVID-19 diagnosis.