



2019-nCoV Literature Situation Report (Lit Rep)

April 30, 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

- ② **Findings from a systematic review do not support claims that most SARS-CoV-2 infections are asymptomatic, estimating that only about 29% of infections remain asymptomatic throughout the course of infection.**
- ② **A study finds cotton tipped plastic swabs could be just as reliable as the plastic synthetic fiber tipped rayon swabs for diagnosis based on nasopharyngeal sampling.**
- ② **Elevations of serum cancer biomarkers are positively correlated with the pathological progressions of COVID-19, including diffuse and acute lung injuries.**
- ② **A study concludes that males have a higher risk for mortality, hospitalization and mechanical ventilation when compared to a matched cohort of females with similar age, risk behavior, and comorbidities; and gender-based disparities in risk of these outcomes worsen with age.**
- ② **Based on a small number of treated patients (n=6), convalescent plasma treatment may result in viral clearance of SARS-CoV-2, but there was no evidence of a reduction in mortality among critically end-stage COVID-19 patients.**

Non-Pharmaceutical Interventions

- McKeigue and Colhoun suggest that a 'stratify-and-shield' policy—a strategy that would shield elderly and others at high risk of severe disease, while allowing immunity to build up in those at low risk until the entire population is protected—has potential to save lives, and restore economic activity.
- In spite of key uncertainties about the theoretical impact, such as the infection fatality ratio, extent to which infection confers immunity, and performance of a classifier based on medical records, the authors propose that this policy should be considered as an alternative to adaptive social distancing.

McKeigue & Colhoun (Apr 30, 2020). Evaluation of "stratify and shield" as a policy option for ending the COVID-19 lockdown in the UK. Pre-print downloaded Apr 30 from <https://doi.org/10.1101/2020.04.25.20079913>

Transmission

- Findings from this systematic review suggest that most SARS-CoV-2 infections are not asymptomatic throughout the course of infection, contrary to modeling studies that have suggested that 80-90% of SARS-CoV-2 transmissions are asymptomatic. From 8 included studies, the authors estimated the upper bound for the proportion of asymptomatic SARS-CoV-2 infections to be 29% (95% CI: 23-37%).
- An intermediate contribution of pre-symptomatic and asymptomatic infections to overall SARS-CoV-2 transmission means that combination prevention, with enhanced hand and respiratory hygiene, testing, tracing and isolation strategies, and social distancing, will continue to be needed.

Buitrago-Garcia et al. (Apr 29, 2020). *The role of asymptomatic SARS-CoV-2 infections: rapid living systematic review and meta-analysis*. Pre-print downloaded Apr 30 from <https://doi.org/10.1101/2020.04.25.20079103>

Testing and Treatment

- Leung et al. demonstrate that clinical-grade SARS-CoV-2 specific T cells can be isolated from the blood of convalescent donors rapidly and efficiently using SARS-CoV-2 specific peptides and an automated medical device expedient for emergent treatment of severe COVID-19 disease until effective vaccines or treatment are developed.

Leung et al. (Apr 30, 2020). Successful manufacturing of clinical-grade SARS-CoV-2 specific T Cells for adoptive cell therapy. Pre-print downloaded Apr 30 from <https://doi.org/10.1101/2020.04.24.20077487>

- This study explores the pharmacokinetic-pharmacodynamic (PK-PD) relationship of chloroquine (CQ) for COVID-19 by modeling both achievable systemic and pulmonary drug concentrations.
- CQ is unlikely to achieve systemic levels that would exert meaningful anti-viral activity given its in-vitro pharmacodynamics profile. However, if lung exposure is the driver for CQ's activity, the simulations shows that currently suggested dosages can be substantially lowered for therapy or prophylaxis.

Aljayyoussi et al. (Apr 30, 2020). Modelling of Systemic versus Pulmonary Chloroquine Exposure in Man for COVID-19 Dose Selection. Pre-print downloaded Apr 30 from <https://doi.org/10.1101/2020.04.24.20078741>

- This study presents a data-driven tool ([Poolkeh](#)) to allow decision-makers to assess the spread of virus among the world population. This online tool allows users to develop an optimal scheme to pool tests for an entire population based on COVID-19 prevalence in the test population and the sensitivity of the test being used.

Eliaz et al. (Apr 30, 2020). Poolkeh finds the optimal pooling strategy for a population-wide COVID-19 testing (Israel, UK, and US as test cases). Pre-print downloaded Apr 30 from <https://doi.org/10.1101/2020.04.25.20079343>

- This retrospective, observational study from COVID-19 patients (n=6 treated and n=15 controls) in 2 Chinese hospitals found that all patients treated with convalescent plasma (CP) achieved viral clearance following treatment; however, there was no evidence that CP reduced mortality in critically end-stage patients.

Zeng et al. (Apr 29, 2020). Effect of Convalescent Plasma Therapy on Viral Shedding and Survival in COVID-19 Patients. *Jour of Infect Dis.* <https://doi.org/10.1093/infdis/jiaa228>

- Freire-Paspuel et al. validated nasopharyngeal sampling for SARS-CoV-2 diagnosis using inexpensive and easily available cotton-tipped plastic swabs with no inhibition effect over PCR reaction instead of plastic synthetic fiber tipped rayon swabs (gold standard by CDC) and found a total agreement among swabs (n=33 positives and n=11 negatives). These results suggest that cotton-tipped swabs could be just as reliable as the rayon swabs, indicating that they can be an option under lack of NP swabs supply.

Freire-Paspuel et al. (Apr 29, 2020). Cotton tipped plastic swabs for SARS-CoV-2 RT-qPCR diagnosis to prevent supplies shortage. Pre-print downloaded Apr 30 from <https://doi.org/10.1101/2020.04.28.20079947>

Clinical Characteristics and Health Care Setting

- This paper introduces a Conditionally Predictively Informative Ranking (CPIR) approach to analyze COVID-19 symptoms. This approach provides a ranking of informative symptoms that may help in clinical settings and potentially be used for broader public policy discussions.
- The authors provide multiple combinations of symptoms associated with typical patients, as well as critical and risky symptoms associated with atypical patients, by demographic characteristics.
Al Rahman et al. (Apr 30, 2020). Informative Ranking of Stand Out Collections of Symptoms: A New Data-Driven Approach to Identify the Strong Warning Signs of COVID 19. Pre-print downloaded Apr 30 from <https://doi.org/10.1101/2020.04.25.20079905>
- A systematic review summarizes characteristics and pregnancy outcomes of pregnant women with COVID-19 and highlights that fetal distress and preterm delivery may be more frequent among pregnant women with COVID-19. There is emerging evidence on vertical transmission, but the clinical relevance of fetal infection remains unclear. No evidence links the SARS-CoV-2 virus to transmission via breast milk.
Rodrigues et al. (Apr 30, 2020). Pregnancy and breastfeeding during COVID-19 pandemic: A systematic review of published pregnancy cases. Pre-print downloaded Apr 30 from <https://doi.org/10.1101/2020.04.25.20079509>
- Findings from a retrospective cohort study indicate that males have a higher risk for mortality, hospitalization and mechanical ventilation when compared to a matched cohort of females with similar age, risk behavior, and comorbidities. This gender-based disparity in risk of poor outcomes among COVID-19 patients is especially pronounced in advanced ages.
Singh et al. (Apr 29, 2020). Gender-Based Disparities in COVID-19 Patient Outcomes: A Propensity-matched Analysis. Pre-print downloaded Apr 30 from <https://doi.org/10.1101/2020.04.24.20079046>
- Results from a case-control study of 46 patients indicate that the elevation of heart-fatty acid binding protein (HFABP) is positively correlated to COVID-19 severity in patients, and elevated HFABP may cause rapid progression in disease severity.
Yin et al. (Apr 29, 2020). Correlation between heart fatty acid binding protein and severe COVID-19: A case-control study. Plos One. <https://doi.org/10.1371/journal.pone.0231687>

Modeling and Prediction

- This modeling study quantifies the impact of intensive care on critical cases by comparing the case fatality among those who did and did not receive intensive care. Findings show that the chance of survival among non-ICU receivers is less than half of ICU receivers (~24% vs ~60%).
Dehkordi et al. (Apr 30, 2020). A deeper look at COVID-19 CFR: health care impact and roots of discrepancy. Pre-print downloaded Apr 30 from <https://doi.org/10.1101/2020.04.22.20071498>

Public Health Policy and Practice

- Rose et al. perform a cross-sectional ecological analysis across 147 administrative municipality areas in England to assess the association between the proportion of people from Black, Asian and Minority Ethnic (BAME) backgrounds, income deprivation, and COVID-19 mortality rates.
- This study indicates that income deprivation and ethnic minority are associated with greater COVID-19 mortality. To reduce these inequalities, governments need to target effective control measures at these disadvantaged communities, and ensure investment of resources reflects their greater need and vulnerability to the pandemic.

Rose et al. (Apr 30, 2020). *Inequalities in COVID19 mortality related to ethnicity and socioeconomic deprivation*. Pre-print downloaded Apr 30 from <https://doi.org/10.1101/2020.04.25.20079491>

- Preliminary findings from a national survey in the US suggest that Emergency Medical Services (EMS) providers may inadvertently contribute to the COVID-19 transmission. The variety of knowledge of EMS providers on COVID-19 indicates that current pandemic education may be insufficient.
- Providers may benefit from improved standardization in pandemic response, specifically with regard to clinical symptomatology recognition, origins of disease, a uniformed decontamination protocol, pandemic-specific inventory in-service, and stricter regulations and enforcement on decontamination of personal items, such as stethoscopes.

Ventura et al. (Apr 30, 2020). *Emergency Medical Services resource capacity and competency amid COVID-19 in the United States: Preliminary findings from a national survey*. Pre-print downloaded Apr 30 from <https://doi.org/10.1101/2020.04.24.20073296>

- Wei et al. retrospectively summarize a series of clinical laboratory tests on serum from 252 COVID-19 patients in a cancer center in China, including metabolic panels and a set of 13 cancer biomarkers. The authors conclude that elevations of serum cancer biomarkers positively correlated with the pathological progressions of COVID-19, including diffuse and acute lung injuries.

Wei et al. (Apr 29, 2020). *Elevations of serum cancer biomarkers correlate with severity of COVID-19*. *Jour of Med Virol*. <https://doi.org/10.1002/jmv.25957>

Other Resources and Commentaries

- [Estimating COVID-19 Prevalence in the United States: A Sample Selection Model Approach](#) – MedRxiv (Apr 30)
- [CovidNLP : A Web Application for Distilling Systemic Implications of COVID-19 Pandemic with Natural Language Processing](#) – MedRxiv (Apr 30)
 - This study provides a model and an interface for clinicians, researchers and policymakers to extract relevant information from peer-reviewed literature on COVID-19 through a publicly available CovidNLP dashboard (<http://covidnlp.tavlab.iiitd.edu.in/>)
- [Systematic review of international guidelines for tracheostomy in COVID-19 patients](#) – MedRxiv (Apr 29)
 - This review of international guidelines for tracheostomy in COVID-19 infected patients summarizes the recommendations available from 18 guidelines from all over the world.
- [Using effective hand hygiene practice to prevent and control infection](#) – Nursing Std (Apr 27)
 - This article details the correct procedure required for effective hand hygiene and emphasizes the need for nurses to keep up to date with evidence-based guidelines.