



2019-nCoV Literature Situation Report (Lit Rep)

April 29, 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

- 📄 **Waste water based epidemiology is a sensitive tool that can be used to monitor spatial and temporal trends of SARS-CoV-2 virus circulation in the population.**
- 📄 **A new eXplainable Deep Learning (XDL) approach to detect COVID-19 from CT scan images is more sensitive, easy to use, and may perform better than other state-of-the-art approaches.**
- 📄 **Yan et al suggest that there is no evidence supporting altering ARBs or ACEIs therapy in COVID-19 patients with arterial hypertension.**
- 📄 **A subset of patients showed that both SARS-CoV-2 and virus-specific IgG can coexist for an unexpectedly long time, with two confirmed cases of at least 50 days.**

Testing and Treatment

- Several studies support use of wastewater-based epidemiology (WBE) to assess viruses circulating in a given community. Rosa et al tested twelve influent sewage samples from Wastewater Treatment Plants collected in high (Milan) and low (Rome) epidemic circulation in Italy, reporting that 6 out of 12 samples tested positive. This study further supports potential use of WBE as a sensitive tool to monitor spatial and temporal trends of SARS-CoV-2 virus circulation in the population.
Rosa et al. (April 29, 2020). First detection of SARS-COV-2 in untreated wastewaters in Italy. Pre-print downloaded Apr 29 from <https://doi.org/10.1101/2020.04.25.20079830>
- This paper presents a new eXplainable Deep Learning (XDL) approach to detect COVID-19 from CT. The authors suggest this new approach is more sensitive and the performance surpasses other state-of-the-art approaches such as the baseline Deep Neural Network approach. It produce highly interpretable results which may be helpful for the early detection of the disease by specialists.
Angelov and Soares. (April, 29 2020). Explainable- by-design approach for COVID-19 classification via CT-scan. Pre-print downloaded Apr 29 from <https://doi.org/10.1101/2020.04.24.20078584>
- Medical editorials have suggested limited use of ACEI and ARBs in people with arterial hypertension during the COVID-19 pandemic because of increased risk of worse clinical outcomes and that calcium channel blockers (CCBs) should be used as an alternative. Using a cohort of 610 COVID-19 cases and 48,667 population-based controls from Zhejiang, China, Yan et al studied usage of ACEIs, ARBs, CCBs and other medications on risk and severity of COVID 19. The team found no evidence to alter ARBs or ACEIs therapy in the context of the pandemic. COVID-19 patients on corticosteroids are at higher risk of developing a severe form of disease and therefore should be monitored closely.
Yan et al. (April 29, 2020). Role of Drugs Affecting the Renin-Angiotensin-Aldosterone System on Susceptibility and Severity of COVID-19: A Large Case-Control Study from Zhejiang Province, China. Pre-print downloaded Apr 29 from <https://doi.org/10.1101/2020.04.24.20077875>

Clinical Characteristics and Health Care Setting

- This review paper addresses the challenges of cancer management in the era of SARS-CoV-2. It discusses the epidemiological, clinical, pathological and radiological characteristics of the disease in cancer patients and its outcomes on this population. The authors focus on strategies that are followed in cancer management with review of national and international guidelines.
Moujaess et al. (April 16, 2020). Cancer patients and research during COVID-19 pandemic: A systematic review of current evidence. Critical Reviews in Oncology / Hematology. <https://doi.org/10.1016/j.critrevonc.2020.102972>
- Jin et al retrospectively investigate blood coagulation function in 147 COVID-19 patients, and the correlation between coagulopathy and disease severity in Wuhan Hospital. Patients with thrombotic disease had a higher case-fatality and were also associated with disease severity. T-PA/PAI-1 Complex and D-Dimer were independent risk factors and predictors for death in patients. The coagulation systems in COVID-19 patients are inordinate, and dynamic monitoring of them, might be a key in the control of COVID-19 death.
Jin et al. (April 29, 2020). The values of coagulation function in COVID-19 patients. Pre-print downloaded Apr 29 from <https://doi.org/10.1101/2020.04.25.20077842>
- Wang et investigated whether antibodies are important for the adaptive immune responses against SARS-CoV-2 infection in 26 COVID-19 patients with mild symptoms in Jinan, China. They report of a subset of patients with both SRAS-CoV-2 and virus-specific IgG coexisting for an unexpectedly long time, with two cases for up to 50 days. One COVID-19 patient who did not produce any SARS-CoV-2-bound IgG successfully cleared SARS-CoV-2 after 46 days of illness, revealing that innate immunity alone may still be powerful enough to eliminate SARS-CoV-2. This report may provide a basis for further analysis of both innate and adaptive immunity in SARS-CoV-2 clearance, especially in non-severe cases.
Wang et al. (April 28, 2020). Long-term Coexistence of SARS-CoV-2 with Antibody Response in COVID-19 Patients. Journal of Medical Virology. <https://doi.org/10.1002/jmv.25946>

Mental Health and Personal Impact

- White and Boor assess the mental health and wellbeing impacts of COVID19 in 600 adults during the initial phase of the lockdown in the UK using an online survey that included COVID19-related questions, the Hospital Anxiety and Depression Scale, the WHO-5, and the OXCAP-MH.
- Self-isolating prior to lockdown, increased feelings of isolation, and having COVID19-related livelihood concerns, were associated with poorer mental health, wellbeing and quality of life. Perceiving increased kindness, community connectedness, and being an essential worker were associated with better mental health and wellbeing outcomes.
Boor and White. (April 29, 2020). The impact of the COVID19 pandemic and initial period of lockdown on the mental health and wellbeing of UK adults. Pre-print downloaded Apr 29 from <https://doi.org/10.1101/2020.04.24.20078550>

Modelling and Prediction

- Rashidi et al introduce a unified platform which integrates visualization capabilities with advanced statistical methods for predicting the virus spread in the short run, using real-time data. The platform is backed up by advanced time series models to capture any possible non-linearity in the data which is enhanced by the capability of measuring the expected impact of preventive interventions such as social distancing and lockdowns.
- It enables lay users, and experts, to examine the data and develop several customized models with different restriction such as models developed for specific time window of the data.

Rashidi et al. (April 29, 2020). *Real-time time-series modelling for prediction of COVID-19 spread and intervention assessment*. Pre-print downloaded April 29 from <https://doi.org/10.1101/2020.04.24.20078923>

- Grimm et al propose an extension of the SEIR model to enable analysis of commonly used measures of epidemic control. The model allows for different infectiousness parameters within and across groups, different asymptomatic, hospitalization, and lethality rates, as well as different take-up rates of tracing apps. It analyzes the interplay of group-specific protection with a large number of groups reflecting sectoral, regional, or age differentiation and group-specific take-up rates for tracing apps.
- The results visualize the sharp trade-offs between different goals of epidemic control, namely a low death toll, avoiding overload of the health system, and a short duration of the epidemic.

Grimm et al. (April 29, 2020). *Extensions of the SEIR Model for the Analysis of Tailored Social Distancing and Tracing Approaches to Cope with COVID-19*. Pre-print downloaded Apr 29 from <https://doi.org/10.1101/2020.04.24.20078113>

Public Health Policy and Practice

- This policy brief sets forth the American Geriatrics Society's (AGS's) recommendations to guide federal, state, and local governments when making decisions about care for older adults in assisted living facilities during the COVID-19 pandemic. It outlines need for PPE, access to testing, public health support for infection control, and workforce training. This brief is based on the situation and any federal guidance or actions as of April 15, 2020.

AGS (April 29, 2020). *American Geriatrics Society (AGS) Policy Brief: COVID-19 and Assisted Living Facilities*. Pre-print downloaded Apr 29 from <https://doi.org/10.1111/jgs.16510>

- Hawk et al, in an opinion piece about COVID-19 in prisons and jails in the US, detail the challenges of social distancing in prisons and jails and the prisoners at high risk for severe infection and death. The authors discuss the effects COVID-19 on prison health care systems, solutions to mitigate harm, and preparing prisoners for release into the community. They conclude that the justice system needs an aggressive and proactive measures to minimize the catastrophe brewing in prisons and jails.

Hawk et al. (April 29, 2020). *COVID-19 in Prisons and Jails in the United States*. *JAMA Internal Medicine*. <https://doi.org/10.1001/jamainternmed.2020.1856>

Other Resources and Commentaries

- [General Guidelines in the Management of an Obstetrical Patient on the Labor and Delivery Unit during the COVID-19 Pandemic](#) -American Journal of Perinatology (Apr 28)
- [COVID-19, unemployment, and suicide](#) – The Lancet (Apr 29)
- [Characteristics and Clinical Outcomes of Adult Patients Hospitalized with COVID-19 — Georgia, March 2020](#) – MMWR (Apr 29)