

2019-nCoV Literature Situation Report (Lit Rep)

May 12, 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

- **An age-stratified model calibrated Seattle, Washington showed early implementation of social distancing interventions would delay the epidemic curve, while later implementation flattened it. The model indicated that the epidemic would rebounded after cessation of social distancing if testing and contact tracing were not performed.**
- **A new approach to antigen testing uses expectorated saliva and does not require RNA purification, removing the need for swabs, RNA extraction kits, and healthcare personnel time/PPE.**
- **A multi-center cohort study found hydroxychloroquine alone or in combination with azithromycin was associated with increased risk of mortality, cardiac arrest, and abnormal ECG. The only statistically significant association was between combination therapy and cardiac arrest.**
- **Readability of COVID-19 related materials on English language websites is generally at the 10th grade level or higher and pandemic health literacy is generally low. Guidelines on behavior that are communicated to the public should be accessible at the lowest possible health literacy levels.**
- **Monitoring of over 12,000 travelers to California was labor intensive and yielded only 3 cases out of over 25,000 total cases.**

Non-Pharmaceutical Interventions

- Using an age-stratified model calibrated to Seattle, Washington in which social distancing interventions reduced contacts for 6 weeks, interventions started earlier in the epidemic were found to delay the epidemic curve, while interventions started later flattened the epidemic curve. Even with only modest reductions in contacts among adults (20-59 years), interventions averted 20% of new cases, and most hospitalizations and deaths. However, the modeled epidemic rebounded when interventions ended, suggesting that social distancing interventions must be implemented in conjunction with testing and contact tracing.

Matrajt and Leung. (Apr 28, 2020). Evaluating the Effectiveness of Social Distancing Interventions to Delay or Flatten the Epidemic Curve of Coronavirus Disease. Emerging Infectious Diseases. <https://doi.org/10.3201/eid2608.201093>

Testing and Treatment

- Shortages in testing materials, including swabs, PPE, reagents, RNA extraction kits, and labor, have restricted availability of testing. A rapid colorimetric assay using the LAMP amplification method

demonstrated high performance on expectorated saliva samples. This method does not require RNA purification or use of swabs, and can be self-collected, which reduces PPE and personnel needs.

Lalli. (May 11, 2020). *Rapid and Extraction-Free Detection of SARS-CoV-2 from Saliva with Colorimetric LAMP*. Pre-print downloaded May 12 from <https://doi.org/10.1101/2020.05.07.20093542>

- A retrospective multi-center cohort study sampled randomly from all admitted participants with laboratory-confirmed COVID-19 in 25 hospitals (N=1,438) and compared hydroxychloroquine alone, azithromycin alone, and combination of the two relative to treatment with neither medication.
- There was a greater odds of cardiac arrest in patients receiving combination therapy (OR 2.13 95% CI: 1.12, 4.05), but otherwise no statistically significant associates with mortality or abnormal electrocardiogram findings.
- However, combination therapy had a non-significant association with increased risk of mortality (HR 1.35, 95% CI 0.76, 2.40) and abnormal ECG findings (OR=1.55, 95%CI 0.89–2.67), as did hydroxychloroquine alone for cardiac arrest (OR=1.91, 95%CI: 0.96–3.81) and abnormal ECG findings (OR=1.50, 95%CI: 0.88–2.58). The effect of hydroxychloroquine alone was also non-significantly associate with a small increased risk of mortality (HR=1.08, 95%CI 0.63–1.85).
- Azithromycin alone was associated with a non-significant lower risk of mortality (HR=0.56, 95%CI 0.26–1.21), cardiac arrest (OR=0.64, 95%CI: 0.27–1.56), and abnormal ECG findings (OR=0.95, 95%CI 0.77–3.24).
- While limited by the observational design, these findings provide concerning evidence that treatment with hydroxychloroquine is associated with a higher likelihood of mortality and adverse cardiac outcomes, and that addition of azithromycin may increase these risks further.

Rosenberg et al. (May 11, 2020). *Association of Treatment With Hydroxychloroquine or Azithromycin With In-Hospital Mortality in Patients With COVID-19 in New York State*. JAMA. <https://doi.org/10.1001/jama.2020.8630>

- A systematic literature review identified four studies of corticosteroid use in patients with COVID-19 reported through March 15, 2020. The effect of corticosteroids on clinical outcomes for COVID-19 was mixed, with corticosteroids having a detrimental impact in two out of four studies. One study found that methylprednisolone could lower the mortality rate by 62% among patients with severe COVID-19.

Veronese et al. (Apr 24, 2020). *Use of Corticosteroids in Coronavirus Disease 2019 Pneumonia: A Systematic Review of the Literature*. *Frontiers in Medicine*. <https://doi.org/10.3389/fmed.2020.00170>

Clinical Characteristics and Health Care Setting

- Rogers et al. screened over 1,000 antibodies for SARS-CoV-2 using serum from a cohort of recovered patients and an animal model (Syrian hamsters). They report multiple highly potent neutralizing antibodies, and demonstrate that passive transfer of these antibodies provides protection against a high dose viral challenge, suggesting potential for both prevention and treatment of COVID-19. These results may also be used to guide vaccine design.

Rogers et al. (May 11, 2020). *Rapid Isolation of Potent SARS-CoV-2 Neutralizing Antibodies and Protection in a Small Animal Model*. Pre-print downloaded May 12 from <https://doi.org/10.1101/2020.05.11.088674>

- As non-pulmonary manifestations of COVID-19 are being increasingly recognized, Hossain et al. evaluated the extent to which non-chest (abdomen/pelvis or cervical spine/neck) CT scans in patients with gastrointestinal or neurological symptoms detected findings highly suspicious for pulmonary COVID-19. Among 62 patients with suspected COVID-19 on presentation, non-chest CT findings provided the initial evidence of COVID-19 related pneumonia in 52% of patients. Among 57 patients without suspected COVID-19 at presentation, this figure was 77%. Patients who received cervical spine/neck (those with neurological presentation) CT had worse outcomes than those who received abdominal/pelvic CT.

Hossain et al. (May 11, 2020). CT Scans Obtained for Nonpulmonary Indications: Associated Respiratory Findings of COVID-19. Radiology. <https://doi.org/10.1148/radiol.2020201743>

- Tools to predict COVID-19 severity will assist in management of critical care capacity and enable earlier targeted interventions to improve outcomes. These authors created a web-based tool for their prognostic model, which defined critical disease as ICU admission, ventilation, or death. They fit the model to patients presenting to UC Irvine, and validated on patients presenting to Emory Healthcare. Covariates included comorbidities, presenting vital signs, and laboratory values. Model discrimination in the validation cohort was found to be high (concordance statistic 0.94, 95% CI: 0.87, 1.01).

Chow et al. (May 11, 2020). Development and External Validation of a Prognostic Tool for COVID-19 Critical Disease. Pre-print downloaded May 12 from <https://doi.org/10.1101/2020.05.06.20093435>

- Shekerdemian et al. conducted a descriptive study among children with COVID-19 admitted to 46 PICUs in North America between mid-March and early April, 2020 (N=48). They found mean age was 13, 83% had significant pre-existing comorbidities, 38% required invasive ventilation, and 23% had failure of 2 or more organ systems. While 4% had died at the time the study concluded, 15 patients (31%) remained hospitalized and three (6%) remained on ventilator support. Targeted treatments were used in 61% of patients, with hydroxychloroquine, alone or in combination, being most commonly used. The median PICU and hospital lengths of stay for those who were discharged was 5 and 7 days, respectively.

Shekerdemian et al. (May 11, 2020). Characteristics and Outcomes of Children With Coronavirus Disease 2019 (COVID-19) Infection Admitted to US and Canadian Pediatric Intensive Care Units. JAMA Pediatrics. <https://doi.org/10.1001/jamapediatrics.2020.1948>

Public Health Policy and Practice

- The mean readability score for the first 100 English language websites found using the search term “coronavirus” estimated that readability levels for nearly all websites exceeded the 10th grade by at least four of five tests, with one test finding a mean readability level of grade 18 (graduate school level) across the sampled websites. The majority of COVID-19 messages are thus difficult for the average American to read
- Guidelines on behavior that are communicated to the public should be readable at an “easy” level.

Basch et al. (May 11, 2020). Public Health Communication in Time of Crisis: Readability of On-Line COVID-19 Information. Disaster Medicine and Public Health Preparedness. <https://doi.org/10.1017/dmp.2020.151>
- Between early February and mid-March 2020 almost 12,000 passengers from selected countries were screened upon entry to the US and monitored by local health jurisdictions in California. Of

these, 3 travelers were matched to COVID-19 patients reported to the state by April 15th, out of over 25,000 cases overall. This effort was found to be labor-intensive and its utility limited by incomplete information and asymptomatic transmission. These efforts have diverted resources needed for implementing other non-pharmaceutical interventions against COVID-19.

Myers et al. (May 11, 2020). Identification and Monitoring of International Travelers During the Initial Phase of an Outbreak of COVID-19 — California, February 3–March 17, 2020. MMWR. Morbidity and Mortality Weekly Report. <https://doi.org/10.15585/mmwr.mm6919e4>

- A COVID-19 Management Assessment and Response (CMAR) tool was used to assess 24 correctional facilities in Louisiana and identified general awareness and understanding of prevention guidance among administrators. While limited ability to quarantine exposed persons and inability to engage in social distancing likely contributed to transmission in these facilities, the CMAR tool could be implemented more broadly to identify gaps in COVID-19 management practices.

Wallace et al. (May 8, 2020). Public Health Response to COVID-19 Cases in Correctional and Detention Facilities — Louisiana, March–April 2020. MMWR. Morbidity and Mortality Weekly Report. <https://doi.org/10.15585/mmwr.mm6919e3>

- A literature review of health literacy related to COVID-19, MERS, and SARS, which included 70 articles, found low pandemic health literacy, ranging from 4.3% to 57.9% among medical-related populations, and from 4% to 82.5% among non-medical populations. The items most frequently evaluated were knowledge about symptoms and transmission, concern about infection, and practices related to mask use and hand hygiene. Higher education level, older age, and female gender were associated with higher health literacy.

Seng and YEAM. (May 11, 2020). Pandemic Related Health Literacy - A Systematic Review of Literature in COVID-19 SARS and MERS Pandemics. Pre-print downloaded May 12 from <https://doi.org/10.1101/2020.05.07.20094227>

Other Resources and Commentaries

- [COVID-19 and Postinfection Immunity: Limited Evidence, Many Remaining Questions](#) – JAMA (May 11)
- [Reactivation of COVID-19 pneumonia: a report of two cases](#) – Journal of Infection (May 7)
- [Pain: A Potential New Label of COVID-19](#) – Brain, Behavior, and Immunity (May 7)
- [Preliminary Estimate of Excess Mortality During the COVID-19 Outbreak — New York City, March 11–May 2, 2020](#) – MMWR (May 11)
- [Unemployment in the time of COVID-19: A research agenda](#) – Journal of Vocational Behavior (May 8)

Report prepared by the UW MetaCenter for Pandemic Preparedness and Global Health Security and the START Center in collaboration with and on behalf of WA DOH COVID-19 Incidence Management Team