2019-nCoV Literature Situation Report (Lit Rep)
May 13, 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

➢ **Salazar et al. report safety and improved clinical status among 25 patients with severe COVID-19 after transfusing convalescent plasma from donors with confirmed SARS-CoV-2 infection.**

➢ **Low rates of SARS-CoV-2 infection were reported among asymptomatic patients screened prior to admission or a planned procedure at the University of Washington Medical Center.**

➢ **A systematic review and meta-analysis estimates 15% of patients with COVID-19 had gastrointestinal symptoms and nearly one in five had abnormal lab values indicating liver injury.**

➢ **Robust, physician-directed telehealth services can meet a wide range of needs during the acute phase of a pandemic, which can conserve scarce resources and prevent the spread of infections to patients and health care workers.**

➢ **Vitamin D deficiency may be associated with COVID-19 risk. Testing and treatment for vitamin D deficiency to reduce risk of COVID-19 may warrant further consideration.**

Non-Pharmaceutical Interventions

• Menni et al. examine implementation of a smartphone-based app for tracking COVID-19. 2.6 million participants used the app to report their potential symptoms. Among 18,401 who had undergone a SARS-CoV-2 test, the proportion who reported loss of smell and taste was higher in those with a positive result (4,668 of 7,178; 65%) than in those with a negative result (2,436 of 11,223; 22%). A model combining symptoms to predict probable infection predicted that 140,312 (17%) participants are likely to have COVID-19.

> *Menni et al. (May 11, 2020). Real-Time Tracking of Self-Reported Symptoms to Predict Potential COVID-19. Nature Medicine. https://doi.org/10.1038/s41591-020-0916-2*

Testing and Treatment

• Among University of Washington Medical Center asymptomatic patients screened prior to admission and patients screened prior to surgical or aerosolizing procedures, a very low proportion tested positive for SARS-CoV-2.

• Among 349 asymptomatic patients tested at admission, 0.9% (n=3) were positive and 0.6% (n=2) were inconclusive. Among 350 patients undergoing surgical or aerosolizing procedures, 0.9% (n=3) were positive. Among 157 asymptomatic patients tested for any other reason, 7.6% (n=12) were positive and 0.6% (n=1) was inconclusive.

• By comparison, among 473 inpatients with any symptom of COVID-19, 14.3% (n=68) were positive during a time period when the outpatient prevalence of SARS-CoV-2 active infection was 3-5%.

Mays et al. (May 12, 2020). Pre-Procedural Surveillance Testing for SARS-CoV-2 in an Asymptomatic Population Shows Low Rates of Positivity. Pre-print downloaded May 13 from https://doi.org/10.1101/2020.05.08.20078592

- Re-testing of 86 previously SARS-CoV-2 positive patients from a Wisconsin tertiary care center after self-reported symptom resolution showed that 11 (13%) were still positive at a median of 19 days (range 12-24 days) after symptom resolution. Patients who re-tested positive were not significantly different from test-negative patients with respect to days since symptom recovery.
- To the extent that detection of SARS-CoV-2 RNA following the resolution of symptoms is indicative of potential infectiousness, screening for COVID-19 convalescent plasma donors may need to occur later than the currently recommended two weeks following "recovery."

Hess and Hartman. (May 12, 2020). Prolonged Viral RNA Shedding after COVID-19 Symptom Resolution in Older Convalescent Plasma Donors. Pre-print downloaded May 13 from https://doi.org/10.1101/2020.05.07.20090621

- A retrospective cohort study found some evidence that a vitamin D deficiency in the past year was associated with an increased risk of testing positive for SARS-CoV-2.

Meltzer et al. (May 13, 2020). Association of Vitamin D Deficiency and Treatment with COVID-19 Incidence. Pre-print downloaded May 13 from https://doi.org/10.1101/2020.05.08.20095893

- Salazar et al. explored the safety of convalescent plasma therapy among 25 patients with severe and/or life-threatening COVID-19 disease enrolled at the Houston Methodist hospitals. Patients were transfused with convalescent plasma obtained from donors with confirmed SARS-CoV-2 infection who been symptom free for 14 days.
- At 7 days post-transfusion, 9 patients had at least a 1-point improvement in clinical scale, and 7 of those were discharged. By 14 days, 19 (76%) patients had at least a 1-point improvement in clinical status and 11 were discharged. No adverse events due to plasma transfusion were observed.

Salazar et al. (May 13, 2020). Treatment of COVID-19 Patients with Convalescent Plasma in Houston Texas. Pre-print downloaded May 13 from https://doi.org/10.1101/2020.05.08.20095471

Clinical Characteristics and Health Care Setting

- SARS-CoV-2 has high-affinity for the angiotensin converting enzyme 2 (ACE2) receptor, which is highly concentrated in the lungs and cardiovascular tissue, showing a potential mechanism for cardiovascular involvement in COVID-19 cases.
- This literature review of COVID-19 and cardiovascular system involvement found evidence of pre-existing cardiovascular and cerebrovascular disease is a risk-factor for severe infection. COVID-19 patients may be more likely to experience acute cardiac injury, arrhythmia, coagulation defects, and acute stroke and are likely to have poorer outcomes as a result.

Larson et al. (May 12, 2020). COVID-19 and the Cerebro-Cardiovascular Systems: What Do We Know so Far? Journal of the American Heart Association. https://doi.org/10.1161/JAHA.120.016793

- Mao et al. conducted a meta-analysis of 35 studies, including 6,686 patients with COVID-19, to estimate the effects of COVID-19 on the digestive system. The pooled prevalence of digestive symptoms (29 studies, n=6064) was 15% (IQR 10–21) with nausea or vomiting, diarrhea, and loss of appetite being the three most common symptoms.

- The pooled prevalence of abnormal liver functions (12 studies, n=1267) was 19% (IQR 9–32). Subgroup analysis showed patients with severe COVID-19 had higher rates of gastrointestinal symptoms (OR=1.60, 95%CI 1.09–2.36) and liver injury (OR=2.20, 95%CI 1.60–3.02) compared with those with non-severe disease. Patients with gastrointestinal involvement had a higher prevalence of complication (OR=2.51, 95%CI 1.62–3.89).

  Mao et al. (May 12, 2020). Manifestations and Prognosis of Gastrointestinal and Liver Involvement in Patients with COVID-19: A Systematic Review and Meta-Analysis. The Lancet Gastroenterology & Hepatology. https://doi.org/10.1016/S2468-1253(20)30126-6

Mental Health and Personal Impact

- Niles et al. conducted a statewide population-level survey to assess food insecurity in Vermont from March 29-April 12, 2020, during the beginning of a statewide stay-at-home order.
- Among 3,219 respondents, there was a 33% increase in household food insecurity since COVID-19, with 35.6% of food insecure households classified as newly food insecure. Respondents experiencing a job loss were more likely to experience food insecurity (OR=3.43; 95%CI 2.45-4.80). Coping strategies were significantly different between respondents in newly food insecure vs. consistently insecure households.

  Niles et al. (May 13, 2020). The Early Food Insecurity Impacts of COVID-19. Pre-print downloaded May 13 from https://doi.org/10.1101/2020.05.09.20096412

Modeling and Prediction

- Hoffman modeled the effect of unidentified infections, seasonal infectivity, immunity, and non-pharmaceutical interventions on the risk of SARS-CoV-2 in New York State. Simulations revealed dramatic infectivity driven by unidentified infections with a peak basic reproductive number of 5.7.
- Reduction of social distancing by >50% below current levels would result in increased mortality. Endemic infection is likely to occur in the absence of profound sustained immunity.

  Hoffman. (May 12, 2020). Significant Relaxation of SARS-CoV-2-Targeted Non-Pharmaceutical Interventions Will Result in Profound Mortality A New York State Modelling Study. Pre-print downloaded May 13 from https://doi.org/10.1101/2020.05.08.20095505

- Keegan et al. compared the reproductive number (Rt) calculated between two methods, the Wallinga and Teunis (WT) method (forward-looking) and the Cori method (backward-looking) to estimate the impact of all combined non-pharmaceutical interventions in US.
- Results show that most states have been able to reduce the Rt of SARS-CoV-2. However, few states have demonstrated an ability to maintain Rt below a value of 1. The median difference in timing of Rt<1 between the two methods is 6.5 days, highlighting the importance of method selection for Rt estimation to inform policy decision making.

  Keegan et al. (May 13, 2020). The Real Time Effective Reproductive Number for COVID-19 in the United States. Pre-print downloaded May 13 from https://doi.org/10.1101/2020.05.08.20095703

Public Health Policy and Practice

- Banerjee et al. estimate the excess 1-year COVID-19 mortality under different scenarios by levels of transmission suppression and relative risk (RR) of mortality above the baseline level using electronic health records from 3.8 million people in UK.

- Based on a population-based cohort study 20% of the population is in the high-risk category (aged >70 years or aged ≤70 years with at least one underlying condition). Baseline 1-year mortality (absence of COVID-19) is estimated at 4.46% (95%CI 4.41–4.51) in the high-risk category.
- Basic methods are provided to estimate expected increases in mortality under different scenarios of increased mortality risk.

   Banerjee et al. (May 12, 2020). Estimating Excess 1-Year Mortality Associated with the COVID-19 Pandemic According to Underlying Conditions and Age: A Population-Based Cohort Study. The Lancet. https://doi.org/10.1016/S0140-6736(20)30854-0

- Heymann et al. assess the availability of paid sick leave in 193 UN member states. They found 27% of countries do not guarantee paid sick leave from the first day of illness, and 58% do not have explicit provisions to ensure self-employed and gig economy workers have access to paid sick leave benefits.
- Critical gaps remain between jeopardize health and economic security. Comprehensive paid sick leave policies that cover all workers are urgently needed to reduce the spread of COVID-19, and be ready to respond to threats from new pathogens.

   Heymann et al. (May 12, 2020). Protecting Health during COVID-19 and beyond: A Global Examination of Paid Sick Leave Design in 193 Countries. Global Public Health. https://doi.org/10.1080/17441692.2020.1764076

- Margolius et al. examine the effectiveness of a physician telehealth visits during the first five weeks of a 24/7 physician-staffed COVID-19 hotline in Northeast Ohio. Of 4,213 calls referred for a physician telehealth visit, most (79%) were advised to self-isolate at home, 14% were determined to be unlikely to have COVID-19, and 3% were advised to seek emergency care. A total of 287 (7%) patients had a subsequent ED visit, and 44 (1%) were hospitalized with a COVID-19 diagnosis.
- Robust, physician-directed telehealth services can meet a wide range of needs during the acute phase of a pandemic, conserving scarce resources and preventing the spread of infections to patients and health care workers.

   Margolius et al. (May 13, 2020). On the Front (Phone) Lines Results of a COVID-19 Hotline in Northeast Ohio. Pre-print downloaded May 13 from https://doi.org/10.1101/2020.05.08.20095745

Other Resources and Commentaries

- Preventing suicide in the context of the COVID-19 pandemic – World Psychiatry (May 11)
- High SARS-CoV-2 Attack Rate Following Exposure at a Choir Practice — Skagit County, Washington, March 2020 – MMWR (May 12)
- Compassionate drug (mis)use during pandemics lessons for COVID-19 – Pre-print (May 12)
- Coronavirus is spreading under the radar in US homeless shelters – Nature (May 7)
- Coronavirus blood-clot mystery intensifies – Nature (May 8)
- An Update on Current Therapeutic Drugs Treating COVID-19 – Curr Pharm Reports (May 11)
- Against pandemic research exceptionalism - Science (May 1)
- Saliva as a non-invasive sample for the detection of SARS-CoV-2 a systematic review – Pre-print (May 13)
- Sharp Drop in Routine Vaccinations for US Children Amid COVID-19 Pandemic – JAMA Health Forum (May 12)