COVID–19 Literature Situation Report

JUNE 25, 2020

The scientific literature on COVID-19 is rapidly evolving and these articles were selected for review based on their relevance to 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.

The COVID-19 Literature Report is researched, compiled, and edited daily by students and faculty in the University of Washington Schools of Public Health and Medicine. The editors are Brandon Guthrie PhD and Jennifer Ross MD MPH. Contributors include Diana Tordoff MPH, Julianne Meisner BVM&S MS, Lorenzo Tolentino BS, Wenwen Jiang MPH, Sherrilynne Fuller PhD FACMI, Dylan Green MPH, and Diana Louden MLib.

Today's summary is based on a review of 475 articles (361 published, 114 in preprint).

KEY TAKEAWAYS

- **An online survey of a nationally representative US sample found that the level of perceived risk of contracting and dying from COVID-19 was positively associated with health behaviors like handwashing and social distancing. More**
- **Treatment of severe COVID-19 patients with the interleukin (IL)-6 blocker tocilizumab was associated with a 39% lower risk of mechanical ventilation or death in a retrospective study. More**
- **A transmission model found that in a university setting, weekly screening for SARS-CoV-2 could reduce cumulative incidence in students by up to 80 and testing of symptomatic students with a 2-day delay following symptom onset could reduce cumulative incidence by up to 88%. More**

Non-Pharmaceutical Interventions

• An online survey of a nationally representative US sample (n=6,684) found that the median perceived risk of infection with COVID-19 was 10% and death was 5%. An increase of 1 quartile in perceived infection risk was associated with 1.5-fold greater likelihood of reporting handwashing and a 1.2-fold greater likelihood of practicing social distancing behavior.

de Bruin and Bennett. (May 22, 2020). Relationships Between Initial COVID-19 Risk Perceptions and Protective Health Behaviors: A National Survey. American Journal of Preventive Medicine. https://doi.org/10.1016/j.amepre.2020.05.001

• A UK-based study evaluated 82 mobile phone apps released in response to COVID-19 using the Systems Wide Analysis of mobile health-related technologies (SWAT) tool and found that the highest scores were achieved by apps from healthcare organizations such as the National Health Service (NHS) and WHO. Thirty-eight of the apps provided COVID-19 information, 10 were for contact tracing, seven were diagnostic tools, and the remainder had other purposes.

Chidambaram et al. (June 24, 2020). Observational Study of UK Mobile Health Apps for COVID-19. The Lancet Digital Health. https://doi.org/10.1016/S2589-7500(20)30144-8

Transmission

• Pastorino et al. deposited liquid with SARS-CoV-2 on polystyrene plastic, aluminum, and glass surfaces for and evaluated the viral stability and infectivity for 96 hours. They observed the longest period of infectivity on plastic polystyrene surfaces. Using bovine serum albumin to mimic protein content within body fluids of the respiratory system, the authors concluded that moderate protein concentration in droplets (such as from airway secretions) markedly increased the infectivity of SARS-CoV-2. The authors note that other components of respiratory body fluids, such as enzymes and mucins, may have a negative effect on virus infectivity.

Pastorino et al. (June 24, 2020). Prolonged Infectivity of SARS-CoV-2 in Fomites. Emerging Infectious Diseases. https://doi.org/10.3201/eid2609.201788

• [Pre-print, not peer reviewed] Quicke et al. conducted weekly tests for SARS-CoV-2 among 454 asymptomatic health workers from across 5 skilled nurse facilities in Colorado (US) for 5-6 weeks. The testing showed a high level of SARS-CoV-2 infection in some of the facilities, with a general decline in incidence over time at most facilities.

Quicke et al. (June 9, 2020). Longitudinal Surveillance for SARS-CoV-2 RNA Among Asymptomatic Staff in Five Colorado Skilled Nursing Facilities: Epidemiologic, Virologic and Sequence Analysis. Pre-print downloaded June 25 from https://doi.org/10.1101/2020.06.08.20125989

Testing and Treatment

• A randomized trial (n=105) evaluated the effect of treatment with the anti-inflammatory agent colchicine in patients with COVID-19. The group receiving colchicine had a lower rate of clinical deterioration (defined as a 2-grade increase on a 7-grade clinical status scale) (OR = 0.11, 95% CI: 0.01-0.96).
• There were no significant differences between treatment and control groups for cardiac outcomes and inflammatory biomarkers.

Deftereos et al. (June 24, 2020). Effect of Colchicine vs Standard Care on Cardiac and Inflammatory Biomarkers and Clinical Outcomes in Patients Hospitalized With Coronavirus Disease 2019. JAMA Network Open. https://doi.org/10.1001/jamanetworkopen.2020.13136

• Tocilizumab treatment among patients with severe COVID-19, whether administered intravenously or subcutaneously, was associated with a reduced risk of invasive mechanical ventilation or death (adjusted HR = 0.61, 95% CI: 0.40-0.92) in a retrospective study (n=544). However, a significantly larger proportion of tocilizumab recipients were diagnosed with new infections compared with patients treated with standard of care (13% vs 4%, p < 0.0001).

Guaraldi et al. (June 24, 2020). Tocilizumab in Patients with Severe COVID-19: A Retrospective Cohort Study. The Lancet Rheumatology. https://doi.org/10.1016/S2665-9913(20)30173-9

Clinical Characteristics and Health Care Setting

• Using national COVID-19 surveillance data, Ellington et al. found that among women age 15-44 with SARS-Cov-2 infection, pregnant women were more likely to be

hospitalized (RR = 5.41, 95% CI: 5.1-5.6), admitted to ICU (RR = 1.5, 95% CI: 1.1-1.8), and receive mechanical ventilation (RR = 1.7, 95% CI: 1.2-2.4). No association as found with death.

• The study was not able to determine whether hospitalization was related to COVID-19 or pregnancy and was not able to capture pregnancy outcomes.

Ellington et al. (June 25, 2020). Characteristics of Women of Reproductive Age with Laboratory-Confirmed SARS-CoV-2 Infection by Pregnancy Status — United States, January 22–June 7, 2020. MMWR. https://doi.org/10.15585/mmwr.mm6925a1

[Pre-print, not peer reviewed] Marcello et al. reviewed medical records for 22,254 patients tested for SARS-CoV-2 within New York City's public hospital system, including 13,442 who tested positive, 46% of whom were hospitalized and among whom 28% subsequently died. Chronic diseases including hypertension, diabetes, and cardiovascular disease were common among patients who were hospitalized and died in this large and racially/ethnically diverse sample.

Marcello et al. (June 23, 2020). Characteristics and Outcomes of COVID-19 Patients in New York City's Public Hospital System. Pre-print downloaded June 25 from https://doi.org/10.1101/2020.05.29.20086645

Modeling and Prediction

• A modeling study found that heterogeneity in contact rates among population groups can significantly affect the overall level of disease-induced immunity to SARS-CoV-2 that develops in the population. Britton et al. estimate that if R0 = 2.5 in an age-structured community with mixing rates fitted to social activity, then the disease-induced herd immunity level can be around 43%, which is substantially less than the classical herd immunity level of 60% obtained through homogeneous immunization of the population.

Britton et al. (June 23, 2020). A Mathematical Model Reveals the Influence of Population Heterogeneity on Herd Immunity to SARS-CoV-2. Science. https://science.sciencemag.org/content/early/2020/06/22/science.abc6810

• [Pre-print, not peer reviewed] In a transmission model based on Emory University (a medium-size, private university), Lopman et al. found that monthly and weekly screening for SARS-CoV-2 regardless of symptoms can reduce cumulative incidence by

42% and 80% in students, respectively. Testing and quarantining people with symptoms of COVID-19 with a 2-, 4- and 7-day delay following symptom onset results in cumulative incidence reductions of 88%, 79%, and 67%, respectively.

Lopman et al. (June 24, 2020). A Model of COVID-19 Transmission and Control on University Campuses. Pre-print downloaded June 25 from https://doi.org/10.1101/2020.06.23.20138677

• [pre-print, not peer reviewed] Neofotistos and Kaxiras characterized the US's pandemic response at the state level using a multi-wave model, and classified states into three classes. The District of Columbia and 19 other states are classified as declining, where several smaller waves of infection follow a large initial wave. Thirteen states (one of which is Washington State) are classified as stationary, where an initial large wave is followed by waves that do not systematically decline or increase. Eighteen states are classified as exhibiting an increasing trend of reported cases.

Neofotistos and Kaxiras. (June 25, 2020). Modeling the Covid-19 Pandemic Response of the US States. Pre-print downloaded June 25 from https://doi.org/10.1101/2020.06.24.20138982

• Sedov et al. incorporate quarantining into a traditional Susceptible-Infected-Recovered (SIR) model and explore the potential of using drones to deliver tests. Using a medium-sized city (about 100,000 people) in Sweden, the investigators found that the model predicts a substantial decrease in peak number of infected people without increasing the duration of the epidemic. The number of days needed to collect tests from the whole population was dependent on the size of the drone fleet and number of tests that can be loaded onto one drone.

Sedov et al. (June 24, 2020). Modeling Quarantine during Epidemics and Mass-Testing Using Drones. PLOS ONE. https://doi.org/10.1371/journal.pone.0235307

OTHER RESOURCES AND COMMENTARIES

- [Severe Acute Respiratory Syndrome Coronavirus 2-Specific Antibodies in Pets in Wuhan, China](#) – Journal of Infection (June 18)
- [The Coronavirus Disease 2019 (COVID-19) Outbreak and Mental Health](#) – JAMA Psychiatry (June 24)
- [COVID-19 Disease in Children: Not as Mild as We Have Been Led to Believe](#) – World Journal of Pediatrics (June 23)

- [Covid-19 and Ethnic Minorities: An Urgent Agenda for Overdue Action](#) – BMJ (June 23)
- [GM-CSF-Based Treatments in COVID-19: Reconciling Opposing Therapeutic Approaches](#) – Nature Reviews Immunology (June 23)
- [Could Anti-Tubercular Vaccination Protect Against Covid-19 Infection?](#) – Allergy (June 23)
- [Examining the Need for Eye Protection for COVID-19 Prevention in the Community](#) – Infection Control & Hospital Epidemiology (June 24)
- [A Proposed Lottery System to Allocate Scarce COVID-19 Medications](#) – JAMA (June 24)
- [Mortality, Admissions, and Patient Census at SNFs in 3 US Cities During the COVID-19 Pandemic](#) – JAMA (June 24)
- [Covid-19: Demand for Dexamethasone Surges as RECOVERY Trial Publishes Preprint](#) – BMJ (June 23)
- [Merit of an Ursodeoxycholic Acid Clinical Trial in COVID-19 Patients](#) – Vaccines (June 19)

The COVID-19 Lit Rep is currently prepared by the UW MetaCenter for Pandemic Preparedness and Global Health Security and the START Center in collaboration with and on behalf of the Washington State Department of Health. The Lit Rep was originally developed and disseminated by the WA DOH COVID-19 Incident Management Team to support evidence-based decision making throughout the region.